Issued MARCH 1967

SOIL SURVEY

Tate County, Mississippi

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
MISSISSIPPI AGRICULTURAL EXPERIMENT STATION

Major fieldwork for this soil survey was done in the period 1961–1963. Soil names and descriptions were approved in 1964. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1964 This survey of Tate County was made as part of the technical assistance furnished by the Soil Conservation Service to the Tate County Soil Conservation District.

HOW TO USE THIS SOIL SURVEY REPORT

THIS SOIL SURVEY of Tate County contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, buildings, or other structures; and in appraising the value of tracts of land for agriculture, industry, or recreation.

Locating Soils

All the soils of Tate County are shown on the detailed map at the back of this report. This map consists of many sheets that are made from aerial photographs. Each sheet is numbered to correspond with numbers shown on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units, Capability Units, and Woodland Suitability Groups" can be used to find information in the report. This guide lists all of the soils of the county in alphabetic order by map symbol. It shows the page where each kind of soil is described, and also the page for the capability unit and woodland group in which the soil has been placed.

Individual colored maps showing the relative suitability or limitations of soils for many specific purposes can be developed by using the soil map and information in the text. Interpretations not included in the text can be developed by grouping the soils according to their suitability or limitations for a particular use. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitations or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils in the section describing the soils and the section that discusses management of soils for cultivated crops and pasture.

Foresters and others can refer to the section "Use of Soils for Woodland," where the soils of the county are grouped according to their suitability for trees.

Game managers, sportsmen, and others concerned with wildlife will find information about soils and wildlife in the section "Use of Soils for Wildlife."

Community planners and others concerned with recreation can read about the soil properties that affect the choice of campsites, golf courses, playgrounds, and parks in the section "Use of Soils for Recreation."

Engineers and builders will find under "Engineering Uses of the Soils" tables that give engineering descriptions of the soils in the county and that name soil features that affect engineering practices and structures.

Scientists and others can read about how the soils were formed and how they are classified in the section "Formation and Classification of Soils."

Students, teachers, and others will find information about soils and their management in various parts of the text, depending on their particular interest.

Newcomers in Tate County may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the section "Additional Facts About the County."

Cover picture: Traffic interchange between Interstate Highway No. 55 and Mississippi State Highway No. 4 at Senatobia. The Collins soils in the foreground provide good topsoil and fair road fill for highways; the Grenada soils in the background provide fair topsoil and road fill.

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Contents

NOTICE TO LIBRARIANS

Series year and series number are no longer shown on soil surveys. See explanation on the next page.

Issued March 1967

EXPLANATION

SERIES YEAR AND SERIES NUMBER

Series year and number were dropped from all soil surveys sent to the printer after December 31, 1965. Many surveys, however, were then at such advanced stage of printing that it was not feasible to remove series year and number. Consequently, the last issues bearing series year and number will be as follows:

Series 1957, No. 23, Las Vegas and Eldorado Valleys Area, Nev.
Series 1958, No. 34, Grand Traverse County, Mich.
Series 1959, No. 42, Judith Basin Area, Mont.
Series 1960, No. 31, Elbert County, Colo. (Eastern Part)
Series 1961, No. 42, Camden County, N.J.
Series 1962, No. 13, Chicot County, Ark.
Series 1963, No. 1, Tippah County, Miss.

Series numbers will be consecutive in each series year, up to and including the numbers shown in the foregoing list. The soil survey for Tippah County, Miss., will be the last to have a series year and series number.

SOIL SURVEY OF TATE COUNTY, MISSISSIPPI

REPORT BY JERRY S. HUDDLESTON, SOIL CONSERVATION SERVICE

SOILS SURVEYED BY R. C. CARTER, H. S. GALBERRY, JERRY S. HUDDLESTON, A. E. THOMAS, AND W. L. WATTS, SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE, IN COOPERATION WITH THE MISSISSIPPI AGRICULTURAL EXPERIMENT STATION

TATE COUNTY is in the northwestern part of Mississippi (fig. 1). It occupies approximately 383 square miles, or 245,120 acres. The Coldwater River forms the western boundary and part of the northern boundary. Beartail, Hickahala, James Wolf, Senatobia, Arkabutla, and Strayhorn Creeks flow into this river and drain all the western and most of the eastern parts of the county. A small part in the southeastern corner drains into the Tallahatchie River.

About 8,500 acres along the western edge of the county is part of the Mississippi River Delta. The Delta consists chiefly of poorly drained, clayey soils. In the rest of the county, the soils developed chiefly in loess. The loess deposited on the eastern side of the county is thinner, and on some of the steeper slopes the sandy Coastal Plain material is exposed.

The county is largely agricultural. Cotton is the main crop, but the production of other crops and the raising of livestock have increased. Slightly more than one-fourth of the county is in commercial forest.

How The Soil Survey Was Made

Soil scientists made this survey to learn what kinds of soils are in Tate County, where they are located, and how they can be used.

They went into the county knowing they likely would find many soils they had already seen, and perhaps some they had not. As they traveled over the county, they observed steepness, length, and shape of slopes; size and speed of streams; kinds of native plants or crops; kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by roots of plants.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. For successful use of this report, it is necessary to know the kinds of groupings most used in a local soil classification.

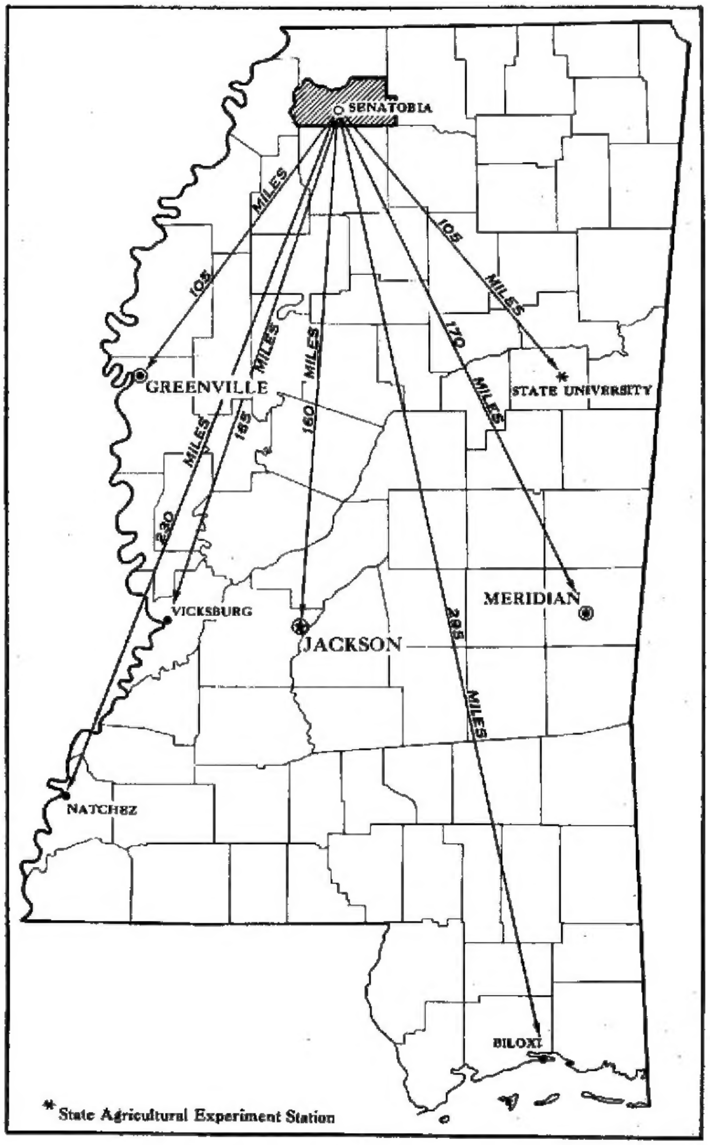

Figure 1.—**Location of Tate County in Mississippi.**

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Memphis and Grenada, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that go with their behavior in the natural landscape. Soils of one series can differ in texture of the surface soil and in slope, stoniness, or some other characteristic that affects use of the soils by man.

Many soil series contain soils that differ in texture of their surface layer. According to such differences in texture, separations called soil types are made. Within a series, all the soils having a surface layer of the same texture belong to one soil type. Alligator clay and Alligator silty clay loam are two soil types in the Alligator series. The difference in texture of their surface layers is apparent from their names.

Some soil types vary so much in slope, degree of erosion, number and size of stones, or some other feature affecting their use, that practical suggestions about their management could not be made if they were shown on the soil map as one unit. Such soil types are divided into phases. The name of a soil phase indicates a feature that affects management. For example, Memphis silt loam, 2 to 5 percent slopes, eroded, is one of several phases of Memphis silt loam, a soil type that ranges from nearly level to steep.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that greatly help in drawing soil boundaries accurately. The soil map at the back of this report was prepared from the aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning management of farms and fields, a mapping unit is nearly equivalent to a soil type or a phase of a soil type. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil type or soil phase.

In preparing some detailed maps, the soil scientists have a problem of delineating areas where different kinds of soils are so intricately mixed, and so small in size, that it is not practical to show them separately on the map. Therefore, they show this mixture of soils as one mapping unit and call it a soil complex. Ordinarily, a soil complex is named for the major kinds of soil in it, for example, Providence-Ruston complex.

The soil scientists may also show as one mapping unit two or more soils or land types if the differences between them are so small that they do not justify separation for the purpose of the survey. Such a mapping unit is called an undifferentiated soil group, for example, Adler and Morganfield silt loams. Also, on most soil maps, areas are shown that are so rocky, so shallow, or so frequently worked by wind and water that they scarcely can be called soils. These areas are shown on a soil map like other mapping units, but they are given descriptive names, such as Gullied land or Alluvial land.

While a soil survey is in progress, samples of soils are taken, as needed, for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soils in other places are assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soils. Yields under defined management are estimated for all the soils.

But only part of a soil survey is done when the soils have been named, described, and delineated on the map, and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in a way that it is readily useful to different groups of readers, among them farmers, managers of woodland, engineers, and homeowners. Grouping soils that are similar in suitability for each specified use is the method of organization commonly used in the soil survey reports. The soil scientists set up trial groups, based on the yield and practice tables and other data, and test them by further study and by consultation with farmers, agronomists, engineers, and others. Then, the scientists adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

General Soil Map

The general soil map at the back of this report shows, in color, the soil associations in Tate County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of farming or other land use. Such a map is not suitable for planning the management of a farm or field, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect management.

The general soil map of Tate County shows the eight soil associations, which are described in the following pages.

1. Alligator-Dowling association: Poorly drained clayey soils on the flood plain of the Mississippi River

This association occurs near the western edge of the county on the Delta between the bluffs of the uplands and the Coldwater River (fig. 2). It consists of broad, nearly level areas dissected by narrow, shallow depressions. These soils formed in fine-textured sediments deposited in slack water by the Mississippi River. They have a dark-gray to dark grayish-brown, clayey surface layer and a light-gray, heavy, plastic clay subsoil.

The Alligator soils make up most of the acreage. They are in broad, nearly level areas that are dissected by long,

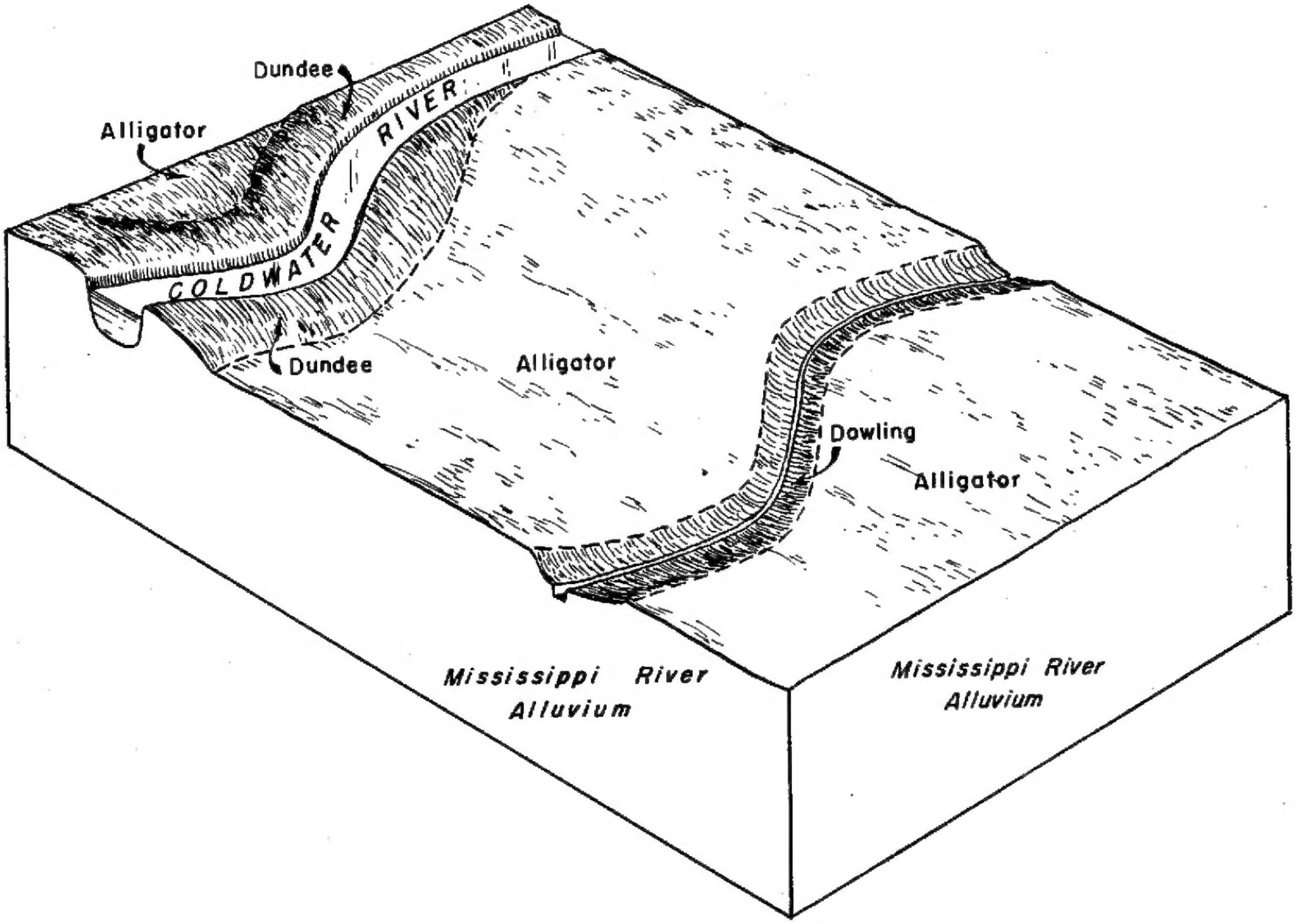

Figure 2.—**Distribution of soils in the Alligator-Dowling soil association.**

narrow, winding depressions consisting of Dowling soils. The Dundee soils make up only a small part of the acreage. They are better drained than the Alligator and Dowling soils and occur on old natural levees at higher elevations.

Much of the association has never been cleared and is now in mixed hardwoods. Farms are generally large. The association is favorable for rice and other special crops. If the soils are adequately drained, they produce good yields of cotton and soybeans.

Except on the narrow ridges of Dundee soils, the soils of this association have some serious limitations for residential, industrial, and recreational uses. They have a very high shrink-swell potential and a low bearing capacity. Also, they are poorly drained, and the water table is at or near the surface for long periods. The Dundee soils, however, are suitable for residential, industrial, and recreational uses.

2. Calloway-Henry association: Somewhat poorly to poorly drained silty soils of the uplands

This association covers only a small part of the county. It consists of small areas scattered throughout the hilly section of the broad, nearly level areas adjacent to flood plains of the major streams (fig. 3). The soils of the Collins-Falaya association are nearby. The Calloway and Henry soils have slopes that range from 0 to 5 percent. The soils of this association formed in wind-deposited silt that ranges from 4 to 20 feet in thickness. They have a brown or grayish-brown silty surface layer.

The Calloway soils make up the greater part of this association. In most places they occur at slightly higher elevations than the Henry soils, which are in level areas or depressions. They have a yellowish-brown silt loam subsoil with gray mottles and a compact, brittle layer, or fragipan, about 16 inches from the surface. The Henry soils are gray throughout and have a fragipan less than 15 inches from the surface in most places.

The association has about equal amounts of pasture and cropland. The soils, especially the Henry, are not among the best agricultural soils. In most areas drainage is needed. Crops generally do not grow well in either wet or dry years. If drained and managed well, however, the soils of this association produce fair to good yields. Trees, shrubs, grasses, and legumes make good to fair growth.

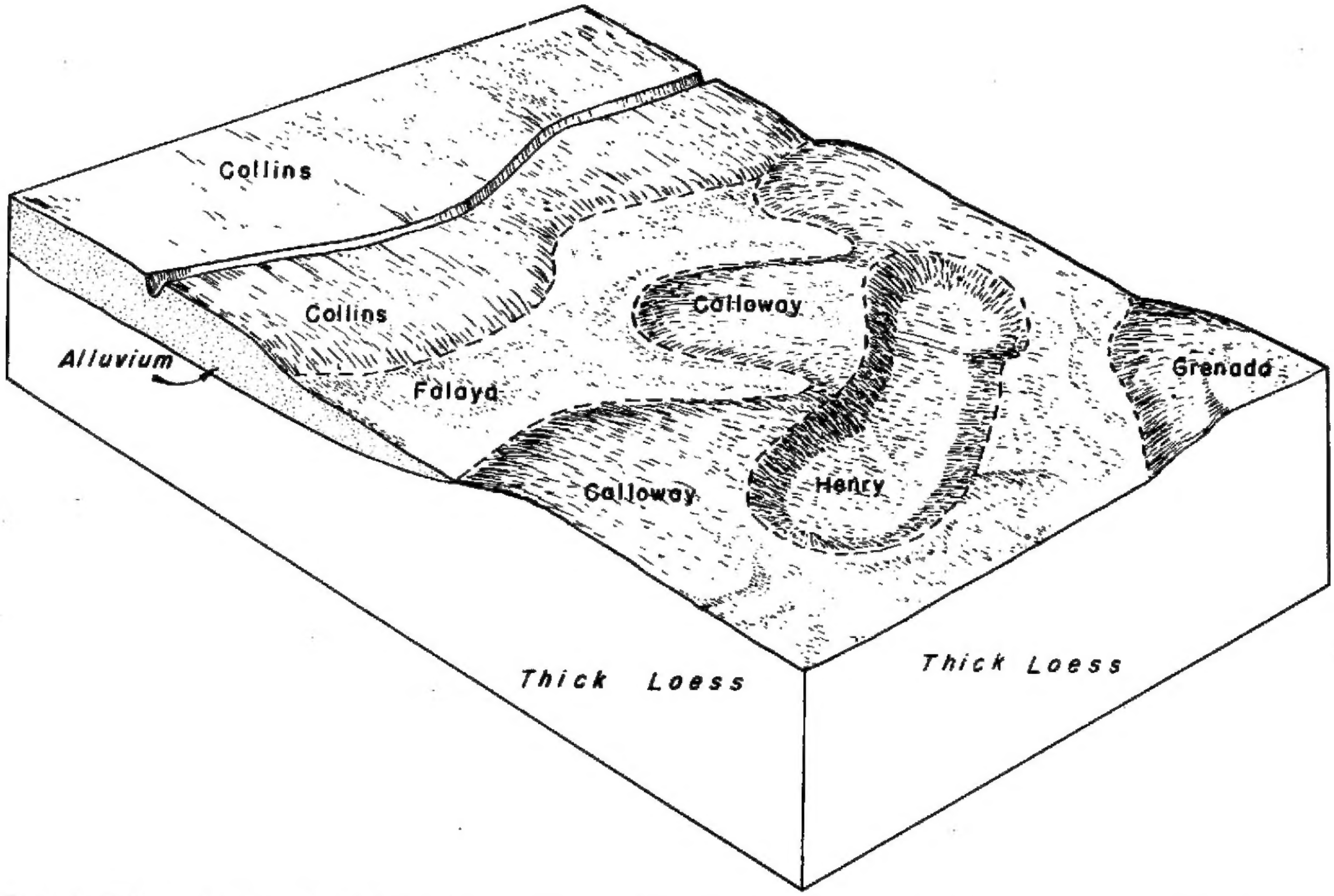

Figure 3.—**Pattern of soils in the Calloway-Henry association (soils over thick loess) and the Collins-Falaya association (soils over alluvium).**

The soils of this association have some limitations for residential and industrial uses. They are somewhat poorly and poorly drained, and the water table remains near the surface for several months each year. The association is poorly suited to most recreational uses except hunting; however, nature trails can be developed satisfactorily in the higher, better drained areas.

3. Collins-Falaya association: Acid silty soils of the bottom lands

This association is made up of bottom lands along streams throughout the county (see fig. 3). Even the smaller streams in this area have wide flood plains. The slopes range from 0 to 3 percent.

The Collins and Falaya soils each make up about 48 percent of the association, and Alluvial land about 4 percent. In most places where the Collins and Falaya soils occur together, the better drained Collins soils are nearer the old channel. The Alluvial land occurs in the eastern part of the county where mixed sandy and silty materials have been deposited on the flood plain by streams.

The Falaya soils are brown and have gray mottles at a depth of about 6 inches. In the Collins soils, gray mottles are below a depth of 18 inches. Both soils are silty to a depth of several feet.

Most of the association is now used for row crops, and a smaller acreage is used for pasture. The soils are favorable for agriculture. A large percentage of the total acreage of row crops in the county is in this association. Drainage ditches are needed in most areas to remove surface water. If the soils are adequately drained and well managed, all crops commonly grown in the county can be grown successfully. Trees, shrubs, grasses, and legumes grow well.

The association has some serious limitations for residential and industrial uses. Flooding is a hazard. Because of this hazard, these soils are of severely limited value for recreation, but they are well suited to hunting.

4. Grenada-Loring association: Silty upland soils that have a fragipan

This association is made up of hills and ridges that cover much of the eastern half of the county. The gently sloping to sloping ridgetops are generally broad and straight. They break to steeper hillsides having slopes of 8 to 18 percent. Long, narrow drains form valleys that have nearly level to gently sloping bottom lands. In most places the bottom lands are not more than 200 feet wide.

The Grenada soils make up about 80 percent of the as-

sociation. They are on ridgetops and hillsides. The Loring soils are on the gently sloping ridgetops and are intermingled with the Grenada soils. Both kinds of soil have formed in wind-deposited silt that ranges from 4 to 20 feet in thickness. They have a brown, silty surface layer and a brown, silty subsoil. At a depth of about 2 or 3 feet there is a compact brittle layer, or fragipan.

The Collins are minor soils of this association that occur on the floor of the valleys. They are brown soils that are mottled gray and brown at 18 inches or more below the surface. They are silty to a depth of several feet.

Most of the association is now used as pasture for dairy cattle and beef cattle. All the acreage was cleared and cultivated, but now only the ridgetops and narrow valleys are generally cultivated. The average farm contains about 150 acres and is smaller than farms in most other associations.

This association is favorable for agriculture. The hills are well suited to pastures, and the bottom lands produce good yields of row crops. Trees, shrubs, grasses, and legumes grow well. Sheet erosion and gully erosion are problems, especially when the soils are cultivated.

The association has some good sites for residential or industrial uses in areas where the ridgetops are relatively broad. If cuts are made in the hillsides, however, the soils are likely to erode, slip, and slide. Extensive recreational areas for playgrounds, hunting, and hiking can be located on soils of this association.

5. Memphis association: Well-drained, silty soils of the uplands

This association is made up of hills and ridges that cover much of the western half of the county. The gently sloping to sloping ridgetops are generally broad and straight. They break abruptly to steeper hillsides that have slopes ranging from 8 percent to as much as 45. Long, narrow drains form valleys that have nearly level to gently sloping bottom lands. In most places the bottom lands are not more than 200 feet wide.

The Memphis soils make up most of the association. They have formed in silt that ranges from 4 to 50 feet in thickness. They are acid and have a brown, silty surface layer and a brown to dark-brown, silty subsoil.

The Collins are minor soils that are in the narrow strips on the bottoms of the valleys. They are acid, brown soils that are mottled gray and brown below a depth of about 18 inches. They are silty to a depth of several feet.

Most of the association is now used as pasture for beef cattle. Except for the steeper areas, most of the acreage has been cleared and cultivated. The acreage now cultivated is generally on the ridgetops and in narrow strips of bottom land. The size of farms varies in this association. Many small farms contain less than 100 acres, but many of the larger farms contain 640 acres or more.

This association is favorable for agriculture. The hills are well suited to pasture and the bottom lands provide good yields of row crops. Trees, shrubs, grasses, and legumes grow well. Sheet erosion and gully erosion are problems, especially when the soils are cultivated.

Where the ridges are relatively broad, this area has some good sites for residential or industrial uses. The steep side slopes have serious limitations for residential or industrial uses. If cuts are made in the hillsides, the soils are likely to erode, slip, and slide. The side slopes are too steep for all recreational uses, except for hunting and hiking.

6. Natchez-Memphis association: Well-drained silty soils on ridges and bluffs

This association is made up of steep to very steep hills and ridges in the western part of the county adjacent to the Delta (fig. 4). The narrow, winding ridgetops break to steep and very steep side slopes that range from 12 to 50 percent. In places along the bluffs, the slopes are as much as 100 percent. Long, narrow drains form valleys that have level strips of bottom land. In most places these strips are not more than 200 feet wide.

The Natchez soils make up about 47 percent of the association. They are on the side slopes. The Memphis soils make up about 43 percent. They are on the ridgetops and, in places, on side slopes. The Natchez soils have formed in thick beds of calcareous silt. They have a dark grayish-brown, silty surface layer and a weakly developed, yellowish-brown, silty subsoil. The Memphis soils have formed in thick beds of acid silt. They have a brown, silty surface layer and subsoil.

The Adler soils make up a minor part of the association. They occupy narrow strips in the bottom lands. They are brown soils that are mottled gray and brown at a depth below about 18 inches. These soils are alkaline and are silty to a depth of several feet.

This association is mostly in timber. Except for small areas of ridgetops and bottom lands, it is unfavorable for agriculture. The soils are too steep for cultivation in most places, but the narrow strips of bottom land can produce high yields of row crops. The soils are favorable for pasture or woodland. Trees, shrubs, grasses, and legumes grow well. Farms in the association are fairly large; they average about 320 acres.

Soils on the steep hillsides are fertile, but landslides and gullies are problems when the soils are cultivated. Sheet erosion and gully erosion are also problems, especially along the face of the bluffs where deep gullies erode back into the hills.

Gravel underlies much of this association, and several gravel pits are in the area. In places, however, the silt mantle is so thick that it is not practical to strip it off in order to mine the gravel.

The association has some serious limitations for residential or industrial uses. When cuts are made into the hillsides, the soils are likely to slip and slide. The area is too hilly for recreational uses, except for hunting and hiking.

7. Ruston-Providence association: Silty and sandy soils in rough, broken areas

This association is in the eastern part of the county in steep to very steep, rough, broken areas (fig. 5). It is made up of narrow, winding ridgetops and steep side slopes that range from 12 to 45 percent. Long, narrow drains form valleys that have level strips of alluvial land. In most places these strips are not more than 150 feet wide.

The acreage of the Ruston and Providence soils in the association is about equal, but the Providence soils are dominant on slopes up to 17 percent. On slopes steeper than 17 percent, the Ruston soils are dominant. The Ruston soils occur on the side slopes, and the Providence on the ridgetops and upper parts of slopes.

The Ruston soils have formed in friable, sandy Coastal Plain materials. They have a brown, sandy surface layer and a yellowish-red, sandy subsoil. The Providence soils have formed in silt about 2 feet thick, which is underlain

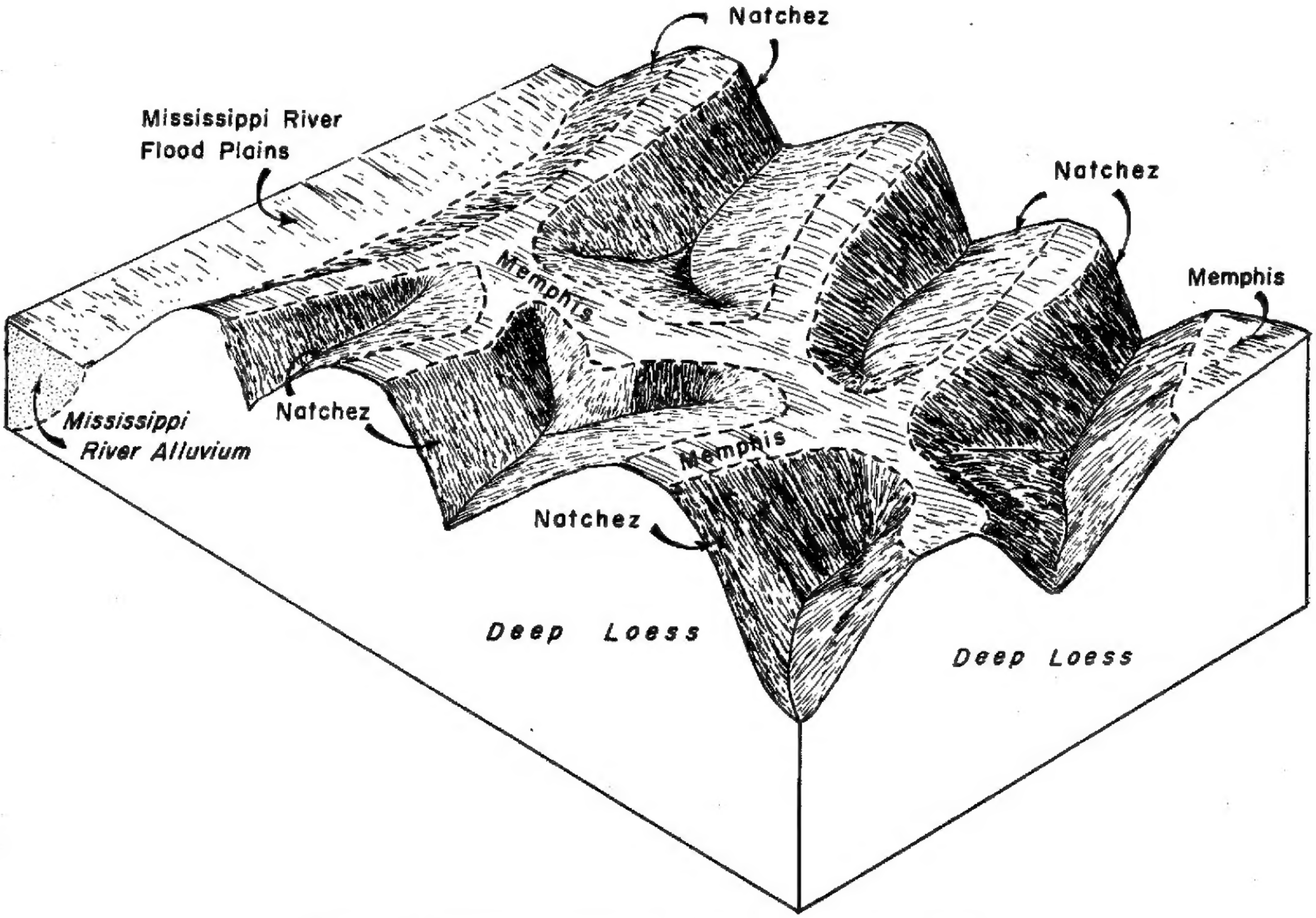

Figure 4.—**Distribution of soils in the Natchez-Memphis soil association.**

by friable, sandy Coastal Plain material. They have a grayish-brown, silty surface layer and a brown, silty subsoil to depth of about 2 feet. This is underlain by brown to reddish-brown, sandy material. A fragipan occurs about 25 inches below the surface. Well-drained, brown, loamy alluvium occurs in the narrow strips in the valleys.

Most of the association is in timber, but some soils that have slopes of 12 to 17 percent have been cleared for pasture. The association is favorable for woodland, and pastures do well on slopes that are less than about 17 percent. Trees, shrubs, grasses, and legumes grow well. Erosion, especially gully erosion, is a problem and is difficult to control because of caving of the underlying sand. The farms in this association are about the average for the county, generally less than 320 acres.

The association has some serious limitations for residential or industrial uses. If cuts are made into the hillsides, the underlying sand erodes readily when it becomes saturated, and this causes gullies. The area is also too hilly for recreational uses, except for hunting and hiking.

8. Adler-Morganfield-Wakeland association: Neutral to alkaline silty soils on bottom lands

This association consists of neutral to alkaline soils on bottom lands near the bluffs in the county. Even the smaller streams in this area have rather wide flood plains. The slopes range from 0 to 3 percent.

The association has about equal acreages of Adler and Morganfield soils and a smaller acreage of Wakeland soils. Most areas of the smaller, local alluvial bottom lands and of the better drained, general alluvial bottom lands consist of Adler and Morganfield soils. The Wakeland soils occur on the somewhat poorly drained, general alluvial bottom lands. The soils of this association are silty to a depth of several feet. Gray mottles appear below a depth of 30 inches in the Morganfield soils, between a depth of 18 and 30 inches in the Adler, and between a depth of 6 and 18 inches in the Wakeland.

Most of the acreage of this association is in row crops and pasture. The farms, few of which are entirely within the area, range from about 40 acres to 360 acres in size.

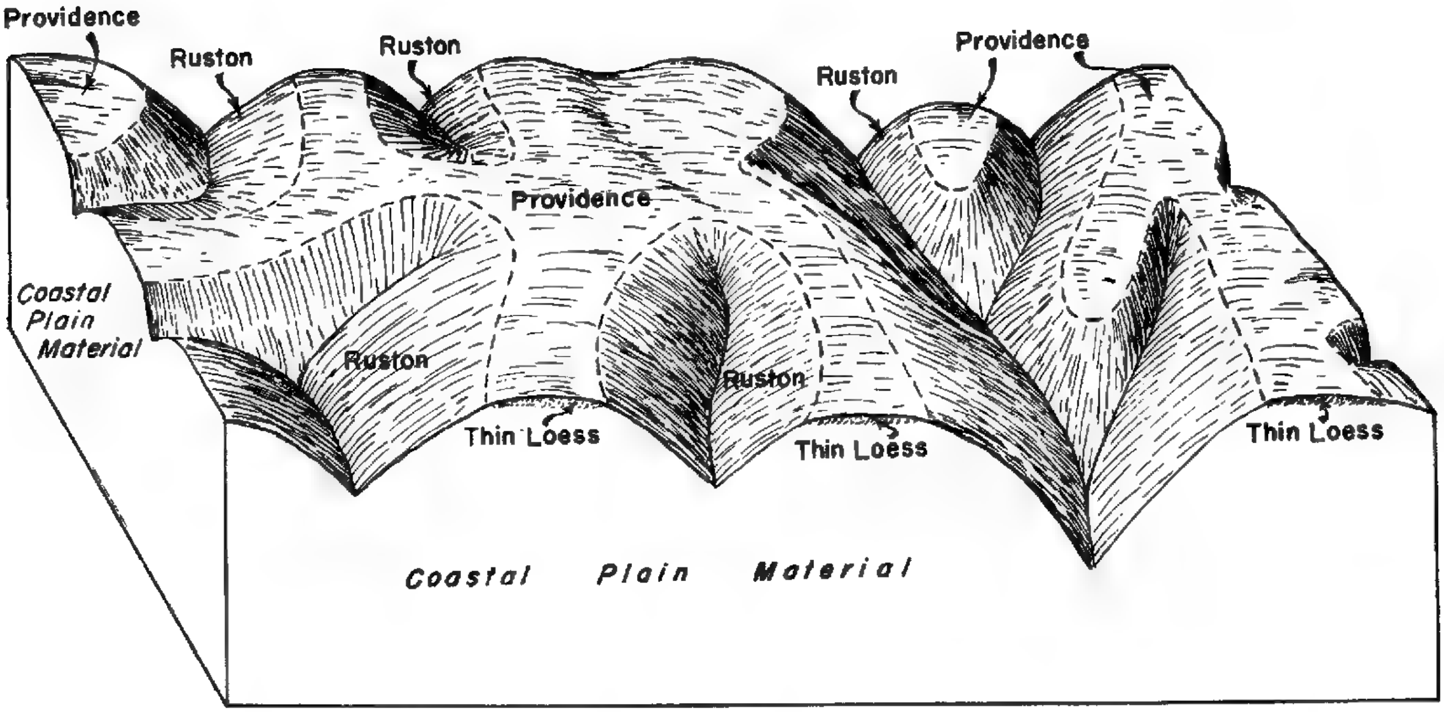

Figure 5.—Distribution of soils in the Ruston-Providence soil association.

This association is favorable for agriculture. As these soils are neutral to alkaline, they do not need liming. Most areas need a system of drainage ditches and diversions to remove excess water. If the soils are adequately drained and well managed, all crops commonly grown in the county produce well. Flooding is a hazard. Trees, shrubs, grasses, and legumes grow well.

The association has some serious limitations for residential or industrial uses. Because of the flood hazard, these soils are poorly suited to extensive recreational uses but are well suited to hunting.

Soils of Tate County

The soils of Tate County are in two main physiographic areas. These areas are the Mississippi River Alluvial Plain, commonly referred to as the Delta, and the upland Loess Belt, sometimes referred to as the Brown Loam Area. A small acreage in the eastern part of the county is of Coastal Plain material.

The soils on the Delta have formed in alluvium of Recent geologic age that was deposited in slack water by the Mississippi River (*13*).[1] These deposits are among the most recent in the State. They were washed mostly from productive lands farther north and are composed of silt, sand, clay, and gravel.

Most areas of the Delta consist of poorly drained, heavy, clayey soils. The soils have high natural fertility, but because they are poorly drained and clayey, they are difficult to work. A large acreage of the Delta in Tate County has remained in hardwoods. Cleared areas are used to produce cotton, soybeans, rice, and pasture. The major problem of managing soils in the area is caused by poor drainage.

Most of the uplands in the county are in the Loess Belt. The soils in this belt have formed in loess of Pleistocene age. These windblown deposits were composed mainly of silt. The loess is underlain by the Citronelle formation of Pliocene age over most of the county. In the eastern part of the county, the loess is underlain by the Kosciusko formation of Eocene age. The soils in the Loess Belt range from gently sloping in places to very steep along bluffs. In many places, great valleys have been formed. The texture of the soils ranges from silt loam to silty clay loam. In places where drainage is good, the color of the soils ranges from yellowish brown to dark brown.

The soils of the Loess Belt are suited to the growing of many crops, and farming is diversified. Corn, cotton, and other row crops produce good yields. The soils are good for pasture, and large numbers of livestock are produced. Both sheet erosion and gully erosion are serious problems in the uplands, particularly where the native vegetation has been cleared. In the valleys of this area, drainage is the major problem.

Loess covers most of the county. It is about 30 feet thick near the bluffs and becomes progressively thinner toward the eastern part of the county. On the steeper slopes in the eastern part, erosion has exposed the sandy materials of the Coastal Plain. These materials are the Kosciusko geologic formation of Eocene age and the Citronelle formation of Pliocene age. The area of exposed Coastal Plain materials is small, and the soils in

[1] Italic numbers in parentheses refer to Literature Cited, p. 83.

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it are in narrow, steep bands. The soils are mostly wooded, but a few fields are used for pasture.

The Tallahatta clay and sand formations of Eocene age crop out in small, scattered areas over the county.

Descriptions of the Soils

The soil series (groups of soils) and single soils (mapping units) of Tate County are described in this section. The acreage and proportionate extent of each mapping unit are given in table 1.

The procedure in this section is first to describe the soil series, and then the mapping units in that series. Thus, to get full information on any one mapping unit, it is necessary to read the description of that unit and also the description of the soil series to which it belongs. As mentioned in the section "How the Soil Survey Was Made," a few of the mapping units are not members of soil series. Gullied land, Made land, and other miscellaneous land types do not belong to a soil series but, nevertheless, are listed in alphabetic order along with the soil series.

A soil symbol in parentheses follows each mapping unit and identifies that unit on the detailed soil map. Listed at the end of the description of a mapping unit are the capability unit and woodland suitability group in which that kind of soil has been placed. The pages on which the capability unit and woodland suitability group are described can be found by referring to the "Guide to Mapping Units, Capability Units, and Woodland Suitability Groups" at the back of this report.

Those who want more detailed information about the soils than is provided in this section should turn to the section "Formation and Classification of Soils." Many terms used in this section, and in other sections of the report, are defined in the Glossary.

Adler Series

In the Adler series are moderately well drained soils that have a dark grayish-brown silt loam surface soil and a dark-brown to yellowish-brown upper subsoil. These soils have formed in alluvium that washed from loessal soils of the bluffs.

Typical profile—

0 to 6 inches, dark grayish-brown, very friable silt loam.
6 to 16 inches, brown to dark-brown, friable silt loam.
16 to 24 inches, mottled yellowish-brown, pale-brown, and light brownish-gray, friable silt loam.
24 to 40 inches +, grayish-brown, friable silt loam mottled with pale brown and dark brown.

TABLE 1.—*Approximate acreage and proportionate extent of the soils*

Soil	Area	Extent
	Acres	*Percent*
Adler silt loam, local alluvium	375	0. 2
Adler and Morganfield silt loams	740	. 3
Adler and Morganfield silt loams, local alluvium	980	. 4
Alligator clay	1, 289	. 5
Alligator silty clay loam	781	. 3
Alligator-Dowling association	3, 251	1. 3
Alluvial land	2, 822	1. 3
Arkabutla silty clay loam	2, 150	. 9
Calloway silt loam, 0 to 2 percent slopes	1, 052	. 4
Calloway silt loam, 2 to 5 percent slopes	1, 202	. 5
Calloway silt loam, 2 to 5 percent slopes, eroded	1, 787	. 7
Collins silt loam	29, 905	12. 3
Collins silt loam, local alluvium	8, 099	3. 3
Dowling clay	598	. 2
Dundee loam, 0 to 2 percent slopes	359	. 1
Dundee silty clay loam, 0 to 2 percent slopes	129	(1)
Falaya silt loam	27, 320	11. 2
Grenada silt loam, 5 to 8 percent slopes	427	. 2
Grenada silt loam, 5 to 8 percent slopes, eroded	3, 015	1. 2
Grenada silt loam, 5 to 8 percent slopes, severely eroded	15, 702	6. 5
Grenada silt loam, 8 to 12 percent slopes	880	. 4
Grenada silt loam, 8 to 12 percent slopes, eroded	675	. 3
Grenada silt loam, 8 to 12 percent slopes, severely eroded	8, 616	3. 5
Grenada-Gullied land complex	20, 942	8. 5
Gullied land, sandy	10, 050	4. 1
Gullied land, silty	21, 370	8. 8
Henry silt loam	646	. 3
Loring-Grenada silt loams, 0 to 2 percent slopes	265	. 1
Loring-Grenada silt loams, 2 to 5 percent slopes	740	. 3
Loring-Grenada silt loams, 2 to 5 percent slopes, eroded	14, 022	5. 8
Loring-Grenada silt loams, 2 to 5 percent slopes, severely eroded	4, 139	1. 7
Made land	337	. 1
Memphis silt loam, 2 to 5 percent slopes, eroded	5, 321	2. 2
Memphis silt loam, 2 to 5 percent slopes, severely eroded	1, 362	. 5
Memphis silt loam, 5 to 8 percent slopes, eroded	963	. 4
Memphis silt loam, 5 to 8 percent slopes, severely eroded	8, 374	3. 4
Memphis silt loam, 8 to 12 percent slopes, eroded	222	(1)
Memphis silt loam, 8 to 12 percent slopes, severely eroded	3, 770	1. 5
Memphis silt loam, 12 to 17 percent slopes, eroded	2, 240	. 9
Memphis silt loam, 12 to 17 percent slopes, severely eroded	4, 010	1. 6
Memphis silt loam, 17 to 45 percent slopes	5, 052	2. 0
Memphis silt loam, 17 to 45 percent slopes, severely eroded	1, 198	. 5
Memphis-Gullied land complex	11, 322	4. 6
Natchez-Memphis silt loams, 12 to 17 percent slopes	335	. 1
Natchez-Memphis silt loams, 17 to 50 percent slopes	2, 110	. 9
Providence silt loam, 8 to 12 percent slopes, severely eroded	537	. 2
Providence-Ruston complex, 12 to 17 percent slopes	3, 230	1. 3
Providence-Ruston complex, 12 to 17 percent slopes, severely eroded	2, 860	1. 2
Ruston-Providence complex, 17 to 50 percent slopes	4, 487	1. 8
Smoothed silty land	1, 700	. 7
Wakeland silt loam	320	. 1
Waverly silt loam	1, 042	. 4
Total	245, 120	100. 0

[1] Less than 0.1 percent.

The Adler soils are in the bottom lands in the bluff area of the county. They occur with the Collins, Falaya, Morganfield, and Wakeland soils. Adler soils are somewhat similar to the Collins but are neutral to mildly alkaline. They are less well drained than Morganfield soils and are better drained than the Falaya and Wakeland soils.

The Adler soils are neutral to mildly alkaline and have moderate natural fertility. They contain a small amount of organic matter and have a high available water capacity. The infiltration rate is slow, and permeability is moderate. Drainage is a problem that must be considered in planning cropping systems. Surface drainage is needed for row crops. The soils are well suited to the crops most commonly grown, and to pasture and trees. If good surface drainage is provided, the soils are especially well suited to cotton and corn.

Adler silt loam, local alluvium (Aa).—This moderately well drained soil formed from very recent silty alluvium that washed a short distance from adjacent hills onto small, narrow, U-shaped stream bottoms. These bottoms, about 150 to 500 feet wide, occur at the head of streams and drains and range from about 400 feet to a quarter of a mile in length. The grade of the bottom lands and the side slopes ranges from 1 to 3 percent.

The surface layer is brown to dark grayish-brown silt loam about 6 inches thick. The underlying material is brown or dark-brown to dark yellowish-brown silt loam stratified with pale-brown layers. Gray mottles occur about 18 to 30 inches below the surface.

The soil is flooded occasionally, especially during heavy summer showers. But because the side slopes and the grade of the bottoms are steep, floods last only a short time and cause only minor damage to crops. In some areas erosion is a moderate hazard. The soil is slightly acid to mildly alkaline and has moderate natural fertility. It responds well to added fertilizer. The soil has high available water capacity. Roots and water easily penetrate the subsoil. The soil has fairly good tilth, but it tends to puddle, crust, and pack if it is left bare.

Most of the acreage has been cleared and is used chiefly for row crops, small patches of truck crops, gardens, and pasture. The soil is well suited to most crops commonly grown, and yields are generally high. Pine and hardwoods grow rapidly. (Capability unit I–1; woodland suitability group 1)

Adler and Morganfield silt loams (Ag).—Adler and Morganfield silt loams were mapped as an undifferentiated group in the western part of the hilly section of the county. They make up only a small acreage of level to nearly level bottom land. Because of their small acreage and the small difference in morphology, these two soils were not mapped separately. The Adler soils are moderately well drained, and Morganfield soils are well drained. There is little uniformity in the pattern or proportion of the component soils. Most delineated areas contain both soils, but a few contain only Adler soils, and a few only Morganfield.

The Adler soils of this group are moderately well drained and have formed from silty loessal alluvium. They have a dark grayish-brown to yellowish-brown silt loam surface layer about 5 inches thick. The underlying material is brown silt loam with gray mottles. The mottles are from 18 to 30 inches below the surface.

The Adler soils are slightly acid to mildly alkaline. They have moderate natural fertility and respond well to added fertilizer. The soils have a high available water capacity. Roots and water easily penetrate the subsoil. The soils have fairly good tilth but tend to puddle, crust, and pack if left bare. Floods are a moderate hazard in the Adler soils.

The Morganfield soils of this unit are well drained and have formed from silty loessal alluvium. They have a dark grayish-brown to yellowish-brown silt loam surface layer about 6 inches thick over brown silt loam material that has gray mottles. The mottles are 30 or more inches below the surface.

The Morganfield soils are slightly acid to mildly alkaline. They have moderate natural fertility and respond well to added fertilizer. The soils have a high available water capacity. Roots and water easily penetrate the subsoil. These soils have fairly good tilth but tend to puddle, crust, and pack if left bare. The flood hazard on the Morganfield soils is moderate.

All the acreage of this undifferentiated group has been cleared and is used chiefly for row crops. If adequately fertilized and drained, the soils of this unit produce high yields of all crops commonly grown. They are well suited to most row crops, pasture, and trees. (Capability unit IIw–3; woodland suitability group 1)

Adler and Morganfield silt loams, local alluvium (Am).—Adler and Morganfield silt loams, local alluvium, were mapped as an undifferentiated group in the western part of the hilly section of the county. They make up only a small acreage. Because of their small acreage and small difference in morphology, these two soils were not mapped separately. The Adler soils are moderately well drained, and the Morganfield soils are well drained. There is little uniformity in the pattern or proportion of the component soils. Most delineated areas contain both soils, but a few contain only Adler soils, and a few only Morganfield.

These soils have formed from recent silty alluvium that washed a short distance from adjacent hills onto small, narrow, U-shaped stream bottoms. These bottoms, about 150 to 500 feet wide, occur at the head of streams and drains and range from about 400 feet to a quarter of a mile in length. The grade of the bottom lands and the side slopes ranges from 1 to 3 percent.

The Adler soils in this undifferentiated group are moderately well drained and have a yellowish-brown silt loam surface layer about 5 inches thick. The underlying material is brown silt loam that has gray mottles between a depth of 18 and 30 inches.

The color of the surface layer ranges from yellowish brown to dark brown; that of the underlying material ranges from yellowish brown to dark brown. In some places, however, this material contains layers that are various shades of brown and yellow. Depth to the gray mottles ranges from 30 inches to about 4 feet.

Morganfield soils are slightly acid to mildly alkaline and contain a small amount of organic matter. They have moderate natural fertility and respond well to added fertilizer. The soils have high available water capacity. Roots and water easily penetrate the subsoil.

Most areas of Adler and Morganfield soils have been cleared and are used chiefly for row crops, small patches of truck crops, gardens, and pasture.

The soils of this unit are flooded occasionally, especially during heavy summer showers. But because of the steep-

ness of side slopes and the grade of the bottom lands, floods last only a short time and cause only minor damage to crops. The soils have fairly good tilth but tend to puddle, crust, and pack if left bare.

If adequately drained and fertilized, these soils produce high yields of all crops commonly grown. They are suited to most row crops, pasture, and trees. (Capability unit I–1; woodland suitability group 1)

Alligator Series

In the Alligator series are poorly drained, level to nearly level soils in low bottoms of the Delta. They have a dark-gray to dark-brown silty clay loam to heavy plastic clay surface layer and a gray, heavy, plastic clay subsoil. These soils have developed from fine-textured alluvium deposited in slack-water areas of the Mississippi River flood plain.

Typical profile—

0 to 3 inches, dark-gray clay or silty clay loam that is plastic and sticky.

3 to 33 inches, gray, very sticky, heavy, plastic clay that has yellowish-brown mottles.

33 to 48 inches +, light-gray, very plastic, very sticky clay that has yellowish-brown mottles.

The Alligator soils are in the Delta part of the county. They occur with the Dowling and Dundee soils. The Alligator soils are somewhat similar to the Dowling soils but occur on broad flat areas, whereas the Dowling soils are in depressions. Alligator soils are not so well drained as the Dundee soils, which are on old natural levees.

The Alligator soils contain a small to moderate amount of organic matter and have high natural fertility. Infiltration and permeability are very slow, and the available water capacity is high. These soils are difficult to manage and can be cultivated only within a narrow range of moisture content. A good water-disposal system is needed to remove surface water when the soils are used for row crops or pasture.

These soils are suited to the most commonly grown pasture plants, to all small grain except barley, and to hardwood trees.

Alligator clay (Ao).—This is a poorly drained, level to nearly level soil in low bottoms of the Delta. The surface layer is gray or brown and gray mottled clay about 3 inches deep. The underlying material is gray, heavy, plastic clay with brown mottles. Soils that are coarser textured in the lower part make up about 3 to 6 percent of mapped areas, and soils in depressions (Dowling) make up about 4 percent. A few small areas that have a silty clay loam surface layer are included. Also included are some areas that have a somewhat darker profile, and in a few places, a slightly alkaline lower subsoil.

This soil is acid. It contains a moderate amount of organic matter and has moderate to high natural fertility. Infiltration and permeability are slow, but the available water capacity is high. This soil is difficult to manage and must be cultivated within a narrow range of moisture content.

Large areas of this soil have been cleared and are used for crops. The soil is used chiefly for soybeans, rice, and cotton.

A good system of V- and W-ditches and good row arrangement are needed for good production. The content of organic matter should be maintained to improve tilth and to increase infiltration. The soil tends to shrink and crack when it dries. It is suited to row crops, pasture, and adapted hardwoods. (Capability unit IIIw–2; woodland suitability group 2)

Alligator silty clay loam (Ar).—This is a poorly drained, level to nearly level soil in low bottoms of the Delta. The surface layer is dark grayish-brown silty clay loam about 4 inches thick. The subsoil is gray, heavy, plastic clay with brown mottles. Soils that are lighter textured in the lower part of the subsoil make up about 3 to 6 percent of mapped areas. A few areas also are included that have a clay surface layer.

This soil is acid. It has moderate to high natural fertility. Infiltration and permeability are slow, but the available water capacity is high. This soil is difficult to manage, and it can be cultivated only within a narrow range of moisture content.

Most areas of this soil have been cleared and are used for row crops and pasture.

A good drainage system of V- and W-ditches and graded rows is needed for good production. The content of organic matter should be maintained to improve tilth and to increase the rate of infiltration The soil shrinks and cracks in dry weather. It is suited to row crops, pasture, and some hardwoods. (Capability unit IIIw–2; woodland suitability group 2)

Alligator-Dowling association (As).—This mapping unit is along the western edge of the county on the flood plain of the Mississippi River. The soils are chiefly wooded and are level to nearly level. The association is dissected by long, narrow, winding drainageways and depressions. The mapped areas of the association are large; many cover several hundred acres. The area of each component soil is large enough to be mapped separately. This association, however, occurs in heavily wooded, swampy areas that are nearly inaccessible, and the time and effort needed for separate mapping are not justified by the objectives of the survey.

Studies made of cleared and drained areas that represent about 10 percent of the unit indicate that the occurrence and distribution of the two dominant soils of the association are fairly uniform. The Alligator soils make up about 70 percent, and the Dowling make up about 20 percent. The remaining 10 percent consists of included soils, such as the better drained Dundee and other soils on natural levees or low terraces.

The Alligator soils are in the broad, nearly level areas. They are poorly drained and have formed in the fine-textured slack-water sediments of the Mississippi River. The surface layer is brown to grayish-brown clay or silty clay loam about 4 inches thick. The underlying material is gray, heavy, plastic clay that has brown mottles.

The surface layer in most places is clay but ranges to silty clay loam. Depth to the gray mottles ranges from the surface to a depth of 6 inches. The subsoil ranges in color from gray to light gray and has few to many mottles that range from yellowish brown to dark brown.

The Alligator soils are acid. They contain a moderate amount of organic matter and have moderate to high natural fertility. Infiltration and permeability are very slow, but the available water capacity is high.

The Dowling soils of this association are in the narrow, winding drainageways and depressions that occur within

the broad, nearly level areas of Alligator soils. They have formed partly from alluvium deposited by the Mississippi River in slack water and partly from alluvium that washed from surrounding soils. The surface layer is brown and gray mottled clay about 5 inches deep. The underlying material is gray, heavy, plastic clay that has brown mottles.

Depth to the gray mottles ranges from 0 to 6 inches. The subsoil ranges in color from gray to light gray and has few to many mottles of yellowish brown to dark brown.

The Dowling soils are acid. They contain a large amount of organic matter and have high natural fertility. Water enters the soils slowly and moves at a very slow rate through them, but the available water capacity is high.

The Alligator and Dowling soils of this association are difficult to manage. They can be cultivated only within a narrow range of moisture content. The removal of surface water is a problem. In dry weather the soils shrink and crack. These soils are suited to pasture, hay, and some hardwoods. (Capability unit Vw-1, both soils; woodland suitability group 2, Alligator part; woodland suitability group 7, Dowling part)

Alluvial Land

Alluvial land (At) consists of somewhat poorly drained to excessively drained, strongly acid soil material on bottom lands formed in alluvium from loess and from sandy Coastal Plain materials. The slopes range from 0 to 3 percent. This land type is stratified with layers of silty and sandy material that vary in thickness. The sandy material ranges from coarse sand to sandy loam. The silty material is generally silt loam. Gravel occurs in some places.

Alluvial land is chiefly on the bottom lands of the eastern one-third of the county. The streams have deposited the mixed sandy and silty material during floods. This land type also occurs at the base of steep slopes where sandy material has been washed down from the hills and mixed with the silty material.

Alluvial land occurs with the Collins, Falaya, and Waverly soils. It is more variable in texture than any of these soils, and in most places it is more excessively drained because it is sandier.

The natural vegetation is mixed hardwoods. Infiltration and internal drainage range from rapid to slow. The available water capacity varies, but in most places it is low. Alluvial land contains a small amount of organic matter and has low natural fertility. It can be worked within a wide range of moisture content.

Most of the acreage has been cleared and is used for crops and pasture. The land is suited to row crops, pasture, and trees. (Capability unit IIIw-1; woodland suitability group 13)

Arkabutla Series

The soils of the Arkabutla series are somewhat poorly drained and have formed in sediments washed primarily from soils formed in silty materials. The Arkabutla soils have a dark grayish-brown silty clay loam surface soil and a mottled silty clay loam subsoil.

Typical profile—

0 to 8 inches, dark grayish-brown, massive silty clay loam.
8 to 14 inches, dark yellowish-brown silty clay loam with pale-brown and gray mottles; slightly plastic.
14 to 37 inches, gray silty clay loam with mottles of various shades of brown; slightly plastic; common black concretions.
37 to 48 inches +, mottled gray and brown silty clay loam; slightly plastic; common black concretions.

The Arkabutla soils occur primarily on the flood plain of the Coldwater River. They are associated with the Falaya, Waverly, and Collins soils. The Arkabutla soils are more poorly drained and finer textured than the Collins soils and are better drained than the Waverly. The Arkabutla soils closely resemble the Falaya in color and drainage, but they are finer textured throughout and have silty clay loam surface and subsurface layers, whereas the Falaya soils have silt loam surface and subsurface layers.

The Arkabutla soils are acid. They contain a small amount of organic matter and have moderate natural fertility. Infiltration is slow, and permeability is moderate to slow. The available water capacity is high. The Arkabutla soils are suited to grasses and hardwoods. If properly managed and drained, they are suited to row crops.

Arkabutla silty clay loam (Au).—This is a somewhat poorly drained, level to nearly level soil in alluvium. The surface layer is dark yellowish-brown silty clay loam about 8 inches thick. The silty clay loam underlying material is mottled with shades of yellow, brown, and gray. The gray mottles occur between a depth of 6 and 18 inches. Poorly drained soils (Waverly) make up about 5 to 10 percent of mapped areas. Also, a few small areas are included that have a silt loam surface layer.

The soil contains a small amount of organic matter and is slightly acid to strongly acid. It has moderate natural fertility. Water enters the surface soil slowly and moves at a moderate to slow rate through the subsoil. The available water capacity is high.

A large acreage of this soil has been cleared and is now used for pasture and for row crops, chiefly soybeans and corn. Most of the acreage, however, is still in trees.

If large applications of fertilizer and adequate drainage are used, this soil produces good yields of crops and forage plants. Because it is fine textured, this soil must be cultivated within a narrow range of moisture content. This soil is well suited to grasses and to some hardwoods. (Capability unit IVw-1; woodland suitability group 3)

Calloway Series

The soils of the Calloway series are somewhat poorly drained and have a brittle, compact fragipan. They have nearly level to gentle slopes and are in the uplands. These soils have formed in thick loess.

Typical profile—

0 to 5 inches, brown, friable silt loam.
5 to 11 inches, yellowish-brown silt loam with pale-brown mottles.
11 to 14 inches, yellowish-brown silt loam with pale-brown and light brownish-gray mottles.
14 to 52 inches, mottled pale-brown, yellowish-brown, dark-brown, and gray silt loam (fragipan).

The Calloway soils are in the nearly level to gently sloping uplands adjacent to the flood plains of major streams and in small areas scattered throughout the hilly part of the county. They are adjacent to the Memphis, Loring,

Grenada, and Henry soils. The Calloway soils are grayer than the Memphis, Loring, and Grenada soils and are more poorly drained. They are browner and better drained than the Henry soils.

The Calloway soils are strongly acid and contain a small amount of organic matter. They have moderate natural fertility. The infiltration rate is slow, and permeability is moderate in the upper part of the subsoil and very slow in the fragipan. The available water capacity is moderate. Most areas of these soils have been cleared and are used for pasture and row crops. Under good management, they produce fair to good yields of crops most commonly grown. Drainage is a problem that must be considered when planning a cropping sequence.

Calloway silt loam, 0 to 2 percent slopes (CaA).—This somewhat poorly drained soil has a dark-brown to brown and gray mottled surface layer 5 to 10 inches thick. The subsoil is yellowish-brown silt loam to light silty clay loam with pale-brown and light brownish-gray mottles. A fragipan occurs at a depth of about 15 inches and an increase in the amount of clay is evident. Gray soils that have a fragipan (Henry) make up 5 to 10 percent of mapped areas, and soils with a browner subsoil (Grenada) make up 2 to 5 percent.

This soil is strongly acid and contains a small amount of organic matter. It has moderate natural fertility. Water enters the surface soil slowly but moves at a moderate to slow rate through the subsoil. The available water capacity is moderate.

Most of the acreage has been cleared and is now used for pasture or crops. If large applications of fertilizer and a good drainage system are used, good yields of most crops can be produced. (Capability unit IIw–5; woodland suitability group 5)

Calloway silt loam, 2 to 5 percent slopes (CaB).—This is a somewhat poorly drained soil that has a dark-brown to brown and gray mottled surface layer 5 to 10 inches thick. The yellowish-brown mottled subsoil has a fragipan at a depth of about 14 inches. Gray soils that have a fragipan (Henry) make up about 5 percent of the mapped areas, and browner soils (Grenada) make up about 5 percent. Also, small patches are included that have a thinner surface layer.

The soil is strongly acid and contains a small amount of organic matter. It has moderate to low natural fertility. Water enters the surface soil slowly and moves at a moderate to slow rate through the subsoil. The available water capacity is moderate to low.

Most of the acreage of this soil has been cleared and is used for crops and pasture. If large applications of fertilizer are used, good yields of most crops can be produced. A drainage system is needed, however, to remove excess water. (Capability unit IIw–5; woodland suitability group 5)

Calloway silt loam, 2 to 5 percent slopes, eroded (CaB2).—This is a somewhat poorly drained soil that has a dark-brown silt loam surface layer about 2 to 5 inches thick. In a few areas the subsoil material is exposed. Also, in some areas rills and shallow gullies are common. The yellowish-brown, mottled subsoil has a fragipan at a depth of about 15 inches. In most areas of this soil that are in pasture, the surface layer is mottled with gray. Gray soils that have a fragipan (Henry) make up about 5 percent of mapped areas, and browner soils (Grenada) about 5 percent.

This soil is strongly acid and contains a small amount of organic matter. It has moderate to low natural fertility. Water enters the surface soil slowly and moves at a moderate to slow rate through the subsoil. The available water capacity is moderate to low.

Nearly all the acreage of this soil has been cleared and cultivated. Now it is used mostly for crops and some pasture. If large applications of fertilizer are used, fairly good yields of most crops can be produced. A drainage system, however, is needed for the removal of excess water. (Capability unit IIw–5; woodland suitability group 5)

Collins Series

In the Collins series are moderately well drained soils that have a brown silt loam surface soil and a dark yellowish-brown or yellowish-brown upper subsoil. These soils have formed in alluvium that washed from silty loessal uplands.

Typical profile—

0 to 7 inches, brown, very friable silt loam.
7 to 26 inches, dark yellowish-brown to yellowish-brown, friable silt loam with light brownish-gray mottles in the lower part.
26 to 40 inches +, mottled light brownish-gray, yellowish-brown, and pale-brown silt loam.

The Collins soils are on bottom lands throughout the county. They occur with Falaya, Adler, Morganfield, Wakeland, and Waverly soils. Collins soils are more poorly drained than the Morganfield and are better drained than the Falaya, Wakeland, and Waverly soils. They are similar to Adler soils in color, drainage, and texture. The Collins soils are acid, whereas Adler soils are neutral to mildly alkaline.

The Collins soils are medium acid to strongly acid and have moderate natural fertility. They contain a small amount of organic matter. Infiltration is slow, and permeability is moderate. The available water capacity is high. Need for drainage must be considered when planning a cropping system (fig. 6).

Surface drainage is needed for row crops. These soils are well suited to nearly all crops commonly grown, and to pasture and trees.

Collins silt loam (Cm).—This is a moderately well drained, level to nearly level soil that formed in silty alluvium. It has a brown silt loam surface layer about 7 inches thick. The underlying material is yellowish brown to dark brown and has gray mottles between a depth of 18 and 30 inches. Well-drained soils make up about 5 to 10 percent of mapped areas, and somewhat poorly drained soils (Falaya) about 5 percent. Also, included in the mapped areas farther west are small areas that are neutral to slightly alkaline.

This soil is acid. It contains a small amount of organic matter and has moderate natural fertility. Crops on it respond well to added fertilizer. Water enters the surface soil at a moderate rate and moves at a moderate rate through the subsoil. This soil has high available water capacity. It can be worked within a wide range of moisture content. The flood hazard is moderate.

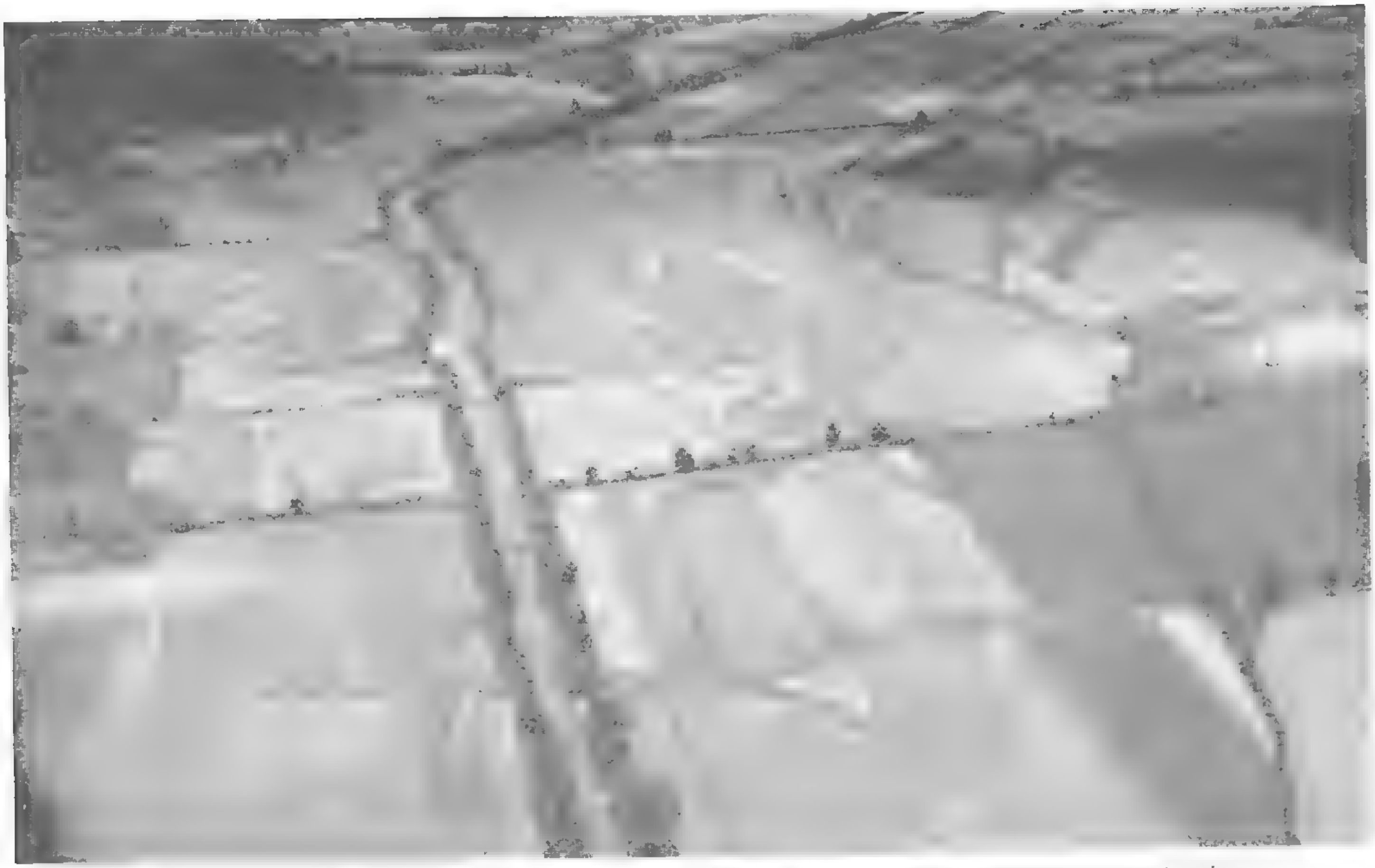

Figure 6.—Aerial view of the James Wolf drainage canal. Kudzu growing on the banks helps to prevent caving.

Most of the acreage of this soil has been cleared and is used for row crops and pasture. If large applications of fertilizer and adequate drainage are used, this soil produces high yields of all crops commonly grown. A cover should be maintained on this soil as much of the time as is practical to reduce crusting and packing. If the soil is cultivated, a plowpan may form. (Capability unit IIw-3; woodland suitability group 6)

Collins silt loam, local alluvium (Co).—This moderately well drained soil formed from very recent silty alluvium that washed a short distance from adjacent hills onto small, narrow, U-shaped stream bottoms. These bottoms, about 150 to 500 feet wide, occur at the head of streams and drains and range from about 400 feet to a quarter of a mile in length. The grade of the bottom lands and the side slopes ranges from 1 to 3 percent.

The surface layer is brown or dark-brown silt loam about 6 inches thick The underlying material is brown or dark-brown to dark yellowish-brown silt loam stratified with pale-brown layers. Gray mottles occur about 18 to 30 inches below the surface.

The soil is flooded occasionally, especially during heavy summer showers. But because the side slopes and the grade of bottom lands are steep, floods last only a short time and cause only minor damage to crops. In some areas erosion is a moderate hazard. The soil is medium acid to strongly acid and has moderate natural fertility. Crops respond well to added lime and fertilizer. The soil has high available water capacity. Roots and water easily penetrate the subsoil. The soil has fairly good tilth, but it tends to puddle, crust, and pack if it is left bare.

Most of the acreage has been cleared and is used for row crops, small patches of truck crops, gardens, and pasture. The soil is well suited to most crops commonly grown, and yields are generally high. Pine and hardwoods grow rapidly. (Capability unit I-1; woodland suitability group 6)

Dowling Series

The Dowling series consists of poorly drained soils in depressions on the Delta. They have a mottled brown and gray, heavy, plastic clay surface layer over a gray, very heavy, plastic clay subsoil. These soils have formed in fine-textured alluvium deposited in slack water by the Mississippi River.

Typical profile—

0 to 3 inches, mottled brown and gray clay that is very plastic and sticky.
3 to 30 inches, gray, very sticky, heavy, plastic clay with yellowish-brown mottles.
30 to 48 inches +, gray, very sticky, heavy, plastic clay with brown mottles.

The Dowling soils are in the Delta part of the county. They occur with the Alligator soils but differ mainly in position. The Dowling soils are in depressions, whereas the Alligator soils are in the broader, nearly level areas.

The Dowling soils contain a moderate to large amount of organic matter and have high natural fertility. Infiltration and permeability are very slow. The available water capacity is high.

The soils are difficult to manage and must be cultivated within a narrow range of moisture content. A good water-disposal system is needed if the soils are used for row crops or pasture.

If backwaters and other flooding are controlled, the Dowling soils are suited to most commonly grown pasture plants, all small grain except barley, and hardwoods.

Dowling clay (Dc).—This poorly drained, heavy clay soil is in nearly level areas or in depressions on the Delta. The surface layer is mottled gray and brown clay about 3 inches thick. The underlying material is gray, heavy, plastic clay with brown mottles.

This soil is acid. It contains a large amount of organic matter and has high natural fertility. Water enters the soil and moves through it at a very slow rate, but the available water capacity is high. This soil is difficult to manage and can be cultivated only within a narrow range of moisture content.

Most areas of this soil have been cleared and are used chiefly for rice and soybeans. A good drainage system consisting of V- and W-ditches that have adequate outlets is needed. Removal of the surface water from this soil is a serious problem. Runoff from higher soils collects on this soil, and often drainage is hindered by inadequate outlets. In dry weather the soil shrinks and cracks. It is suited to pasture, hay, and some hardwoods. (Capability unit Vw–1; woodland suitability group 7)

Dundee Series

In the Dundee series are moderately well drained and somewhat poorly drained soils on old natural levees of the Delta. These soils have formed in thinly stratified layers of loamy and clayey alluvium deposited by the Mississippi River.

Typical profile—

- 0 to 4 inches, dark grayish-brown, friable fine sandy loam or loam.
- 4 to 9 inches, brown loam to clay loam with gray mottles.
- 9 to 19 inches, brown to dark grayish-brown loam with gray mottles.
- 19 to 48 inches +, mottled brown and gray, friable loam.

The Dundee soils are in the western part of the county along the Coldwater River. They occur with the Alligator and Dowling soils. The Dundee soils are better drained and are coarser textured than the Alligator and Dowling soils.

The Dundee soils are medium acid. They contain a small amount of organic matter and have high natural fertility. Infiltration and permeability are moderate. The available water capacity is high. These soils are well suited to nearly all commonly grown crops and to pasture and trees. Surface drainage must be considered in planning a cropping sequence.

Dundee loam, 0 to 2 percent slopes (DnA).—This is a deep, moderately well drained to somewhat poorly drained soil. It has a dark grayish-brown loam surface layer about 4 inches thick. The subsoil is dominantly dark grayish-brown loam to clay loam that has common grayish-brown mottles. The underlying material is mottled gray and brown loam. Mapped areas of this soil include small patches that have a fine sandy loam surface layer.

This soil is medium acid. It contains a small amount of organic matter and has high natural fertility. Water enters the soil at a moderate rate and moves through it at a moderately slow rate. The available water capacity is high. This soil has good tilth and can be worked within a wide range of moisture content. It is easily worked, but a plowpan forms readily.

All the acreage of this soil has been cleared and is used for row crops, chiefly cotton. All of the commonly grown crops yield well on this soil. Pasture and hardwoods are also suited. (Capability unit I–2; woodland suitability group 4)

Dundee silty clay loam, 0 to 2 percent slopes (DsA).—This is a moderately well drained to somewhat poorly drained soil that has a dark grayish-brown silty clay loam surface layer about 4 inches thick. The subsoil is brown silty clay loam, underlain by mottled brown and gray loam. Mapped areas of this soil include small patches that have a heavy silt loam surface layer.

The soil contains a small amount of organic matter, is medium acid, and has high natural fertility. Water enters the soil and passes through it at a moderately slow rate. The available water capacity is high. This soil is somewhat difficult to work. Adverse moisture conditions often delay planting in the spring.

Most of the acreage has been cleared and is used for row crops, chiefly cotton and soybeans. If adequate drainage and good management are used, high yields of crops commonly grown can be obtained. The soil is suited to row crops, pasture, and hardwoods. (Capability unit IIw–1; woodland suitability group 4)

Falaya Series

The Falaya series consists of somewhat poorly drained soils that have a brown, friable silt loam surface soil and a mottled silt loam subsoil. These soils have formed in alluvium that washed from loessal uplands.

Typical profile—

- 0 to 8 inches, brown, very friable silt loam.
- 8 to 13 inches, brown silt loam with light-gray and pale-brown mottles.
- 13 to 31 inches, mottled yellowish-brown, light-gray, brown, and pale-brown silt loam.
- 31 to 45 inches +, light-gray silt loam with brown mottles.

The Falaya soils are on bottom lands throughout the county. They occur with the Arkabutla, Collins, Waverly, Adler, Morganfield, and Wakeland soils. The Falaya soils are better drained than the Waverly and are more poorly drained than the Collins, Adler, and Morganfield. In drainage, texture, and color the Falaya soils are similar to the Wakeland soils, but they are acid. The Wakeland soils, in contrast, are slightly acid to alkaline. The Falaya soils closely resemble Arkabutla soils in color and drainage, but their surface and subsurface layers are silt loam, whereas those of the Arkabutla soils are silty clay loam.

The Falaya soils are acid. They contain a small amount of organic matter and have moderate to low natural fertility. Infiltration is slow, and permeability is moderate, but the available water capacity is high. If a good water-disposal system and proper management are used, these

soils are suited to nearly all crops commonly grown in the county.

Falaya silt loam (Fa).—This somewhat poorly drained, level to nearly level soil formed in loessal alluvium. It has a brown silt loam surface layer about 8 inches thick. The underlying material is brown or yellowish-brown silt loam that has gray mottles between a depth of 6 and 18 inches. Moderately well drained soils (Collins) make up about 5 to 10 percent of areas mapped as this soil. Also included are a few small areas of poorly drained soils (Waverly) and a few areas in the western part of the county that are neutral to slightly alkaline.

This soil is acid. It contains a small amount of organic matter and has low natural fertility, but crops respond well to applications of fertilizer. Water enters the soil and passes through it at a moderate rate. The available water capacity is high.

Most areas of this soil have been cleared and are used for crops and pasture. If large applications of fertilizer and adequate drainage are used, this soil produces high yields of all crops commonly grown. A cover should be maintained as much of the time as feasible to reduce crusting and packing. If the soil is cultivated, a plowpan forms readily. (Capability unit IIw-4; woodland suitability group 3)

Grenada Series

The Grenada series consists of moderately well drained, silty, upland soils that have a fragipan. These soils are nearly level to strongly sloping. They have formed in thick beds of windblown silt.

Typical profile—

- 0 to 3 inches, brown, very friable silt loam.
- 3 to 25 inches, dark yellowish-brown silt loam with pale-brown mottles; moderate to weak, medium, subangular blocky structure.
- 25 to 30 inches, light brownish-gray and pale-brown silt over weak, subangular blocky peds of dark yellowish-brown silt loam (fragipan).
- 30 to 50 inches +, mottled pale-brown, dark yellowish-brown, and light brownish-gray silt loam; moderate, medium, subangular blocky structure; peds are firm, compact, and brittle (fragipan).

The Grenada soils occur mostly in the eastern half of the county with the Memphis, Loring, Calloway, and Henry soils. They are not so brown as the Memphis and Loring soils and have a lighter textured subsoil. The Grenada soils are browner than the Calloway and Henry soils.

Grenada soils are strongly acid. They contain a small amount of organic matter and have moderate to low natural fertility. Infiltration is slow, and permeability of the upper part of the subsoil is moderate. The available water capacity is moderate. The Grenada soils are suited to nearly all commonly grown row crops and to pasture and trees. Erosion is a hazard on slopes steeper than 2 percent, and it should be considered when planning a cropping sequence.

Grenada silt loam, 5 to 8 percent slopes (GrC).—This is a moderately well drained soil in the uplands. It has a brown or dark grayish-brown silt loam surface layer 5 to 8 inches thick. The subsoil is yellowish-brown to brown heavy silt loam underlain by a fragipan at a depth of about 28 inches. Small areas that have a browner subsoil (Loring) are included in mapping.

The soil is strongly acid. It contains a small amount of organic matter and has moderate natural fertility. Infiltration is slow, and the movement of water through the upper part of the subsoil is moderate. The movement of water and roots through the fragipan is very slow. The available water capacity, however, is adequate for most crops.

Most areas of this soil now are in mixed hardwoods, but a few are used for pasture. If large applications of fertilizer are used, the soil produces good yields of crops commonly grown. Runoff is moderate to rapid and the erosion hazard is high when the soil is cleared. This soil is suited to row crops, pasture, and trees. (Capability unit IIIe-3; woodland suitability group 8)

Grenada silt loam, 5 to 8 percent slopes, eroded (GrC2).—This is a moderately well drained soil in the uplands. It has a brown silt loam surface layer 2 to 5 inches thick. In a few areas, the subsoil material is exposed, and some fields have a few small gullies or rills. The subsoil is yellowish-brown to brown heavy silt loam underlain by a fragipan at a depth of about 24 inches. Small areas are included in mapping that have a browner, more clayey subsoil (Loring).

The soil is strongly acid. It contains a small amount of organic matter and has moderate natural fertility. Water enters the surface soil slowly and moves at a moderate rate through the upper part of the subsoil. The movement of water and roots through the fragipan, however, is very slow. The available water capacity is moderate.

Most areas of this soil have been cleared and cultivated, but now a large part is used for pasture. If large applications of fertilizer are used, the soil produces good yields of the crops commonly grown. Runoff is moderate to rapid, and the erosion hazard is high if the soil is cultivated. A cover should be maintained on cultivated areas as much of the time as practical to reduce crusting and packing and to increase infiltration. (Capability unit IIIe-3; woodland suitability group 8)

Grenada silt loam, 5 to 8 percent slopes, severely eroded (GrC3).—This is a moderately well drained soil in the uplands. It has a dark yellowish-brown silt loam surface layer that consists of a mixture of the subsoil material and remnants of the original surface soil. The original yellowish-brown subsoil in most areas is exposed and is interspersed with scattered areas of the original brown surface soil. Shallow gullies and a few deep ones are common. A fragipan occurs at a depth of about 19 inches. In the most western areas mapped as this soil, browner soils (Loring), which are deeper to the fragipan in most places, make up about 5 percent.

The soil is strongly acid. It contains a small amount of organic matter and has moderate natural fertility. Water enters the surface soil slowly and moves at a moderate rate through the upper part of the subsoil. Water and roots move very slowly through the fragipan. The available water capacity is moderate.

All areas of this soil have been cleared and cultivated, but now a large part is in pasture (fig. 7). If large applications of fertilizer are used, the soil produces good yields of forage crops. Runoff is moderate to rapid, and the erosion hazard is very high if the soils are cultivated. Row crops, pasture, and trees are suited. (Capability unit IVe-2; woodland suitability group 8)

Figure 7.—**Fescue and white clover on Grenada silt loam, 5 to 8 percent slopes, severely eroded. Under good management, this field will produce 8 animal-unit-months of pasture or 2 tons of hay per acre.**

Grenada silt loam, 8 to 12 percent slopes (GrD).—This is a moderately well drained soil in the uplands. It has a brown or dark grayish-brown silt loam surface layer 5 to 8 inches thick. The subsoil is yellowish-brown to brown heavy silt loam underlain by a fragipan at a depth of about 28 inches. Soils (Providence) with sandy Coastal Plain materials in and below the fragipan make up about 5 percent of the most eastern areas mapped as this soil. In the most western areas, browner soils (Loring), which in most places are deeper to the fragipan, make up about 5 percent.

The soil is strongly acid. It contains a small amount of organic matter and has moderate natural fertility. Water enters the surface soil slowly and moves at a moderate rate through the upper part of the subsoil but slowly through the fragipan. The available water capacity is moderate.

Most areas of this soil are wooded, but a few small areas have been cleared and planted to pasture. If large applications of fertilizer are used, the soil produces good yields of the crops commonly grown. Because of strong slopes and rapid runoff, however, the erosion hazard is high. The soil is best suited to pasture or to trees. (Capability unit IVe–3; woodland suitability group 8)

Grenada silt loam, 8 to 12 percent slopes, eroded (GrD2).—This is a moderately well drained soil in the uplands. It has a brown silt loam surface layer 2 to 5 inches thick. In a few places the subsoil material is exposed. In some fields there are a few small gullies or rills. The subsoil is yellowish-brown to brown heavy silt loam underlain by a fragipan at a depth of about 24 inches. Soils (Providence) that have sandy Coastal Plain material in and below the fragipan make up about 5 percent in the most eastern areas mapped as this soil. Browner soils (Loring), which are deeper to the fragipan in most places, make up about 5 percent in the most western areas mapped.

The soil is strongly acid. It contains a small amount of organic matter and has moderate natural fertility. Water enters the surface soil slowly and moves at a moderate rate through the upper part of the subsoil but slowly through the fragipan. The available water capacity is moderate.

Most areas of this soil are wooded, but some have been cleared and are used for pasture. If large applications of fertilizer are used, the soil produces good yields of the commonly grown forage and row crops. Because of strong slopes, rapid runoff, and a high erosion hazard, the soil is best suited to pasture or woodland. (Capability unit IVe–3; woodland suitability group 8)

Grenada silt loam, 8 to 12 percent slopes, severely eroded (GrD3).—This is a moderately well drained soil in the uplands. It has a dark yellowish-brown silt loam surface layer that consists of a mixture of subsoil material and remnants of the original surface soil. The original yellowish-brown subsoil is exposed in most areas and is interspersed with scattered areas of the original brown surface soil. Shallow gullies and a few deep ones are common. A fragipan occurs at a depth of about 19 inches. In the most eastern areas mapped as this soil, soils (Providence) with sandy Coastal Plain material below a depth of about 24 inches make up about 5 percent. In the most western areas, browner soils (Loring), which are deeper to the fragipan in most places, make up about 5 percent.

The soil is strongly acid. It contains a small amount of organic matter and has moderate natural fertility. Water enters the surface soil slowly and moves at a moderate rate through the upper part of the subsoil. Water and roots, however, move very slowly through the fragipan. The available water capacity is moderate.

All areas of this soil have been cleared and cultivated (fig. 8), but now a large part of the acreage is in pasture.

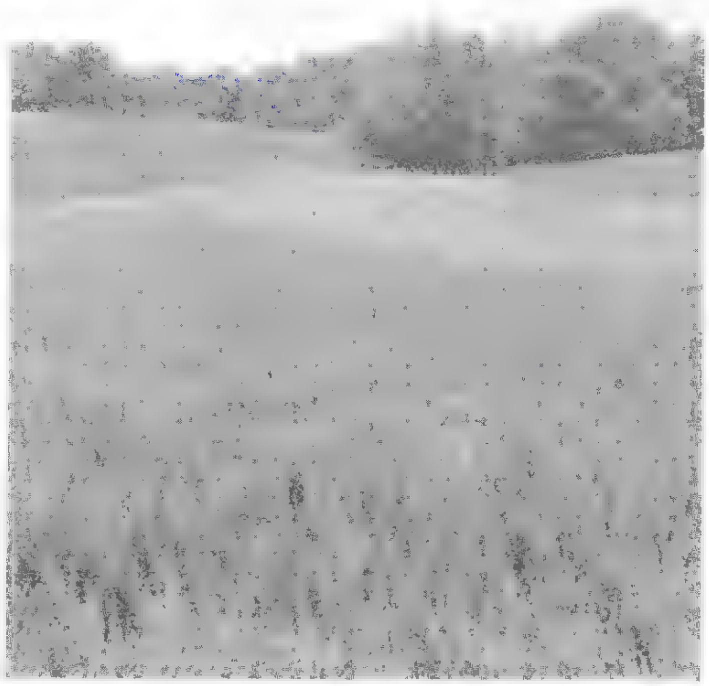

Figure 8.—**Sericea lespedeza on Grenada silt loam, 8 to 12 percent slopes, severely eroded. The light-colored strip is native grass on Collins silt loam.**

If large applications of fertilizer are used, the soil produces high yields of forage crops. Because of the strong slopes, rapid runoff, and high erosion hazard, row crops are not suited. Pasture plants, pines, and hardwoods are well suited. (Capability unit VIe–2; woodland suitability group 8)

Grenada-Gullied land complex (Gs).—This complex of soils is moderately well drained. Slopes range from 2 to 12 percent. Deep gullies, uncrossable by farm machinery, dissect the complex at intervals of 50 to 100 feet. As much as 50 percent of most areas of the complex is gullied.

The present surface layer of the complex consists of the original yellowish-brown heavy silt loam subsoil. In a few places there are remnants of the original brown surface soil. At a depth of 10 to 20 inches there is a brown to dark-brown, brittle fragipan mottled with gray and pale brown. In the gullies the original surface soil and most of the subsoil have been eroded away and the fragipan and underlying material are exposed.

Soils without a fragipan (Memphis) make up about 2 percent of areas mapped as this complex, and soils with sandy loam underlying material (Providence) make up about 3 percent. Also, small patches are included that have a silty clay loam surface soil (Loring).

The soil material is strongly acid. The complex has moderate to low natural fertility, but crops respond well to lime and fertilizer. Because this complex of soils is shallow to the fragipan and is gullied, it has a low available water capacity. Roots and water easily penetrate the upper part of the subsoil of the Grenada soil in the complex but are restricted in the fragipan.

Nearly all the acreage of this complex has been cleared and cultivated, but now a large part is used for pasture and a large part is reverting to woods. If large applications of fertilizer are used, this complex produces moderate to high yields of sod crops. Because of many deep gullies, the use of farm machinery is highly restricted. The erosion hazard is very high if the soils are left bare. Pasture plants and pine trees are suited. (Capability unit VIe–6; woodland suitability group 12)

Gullied Land, Sandy

Gullied land, sandy (Gt) is so severely eroded that in many places the soil cannot be identified. Slopes range from 2 to 25 percent. The surface layer and much of the subsoil have been washed away, and an intricate pattern of gullies has been formed in the exposed sandy material. The gullies are generally U- or V-shaped and have an average depth of 3 to 20 feet.

Originally, these areas were made up of Ruston and Providence soils. But because these soils were not protected, they have been so eroded that generally they cannot be feasibly used for row crops or pasture or reclaimed for agricultural purposes.

The soil materials in this mapping unit are very strongly acid. Infiltration and permeability vary. The available water capacity is moderate to low, and natural fertility is generally low. Although infiltration is generally moderate, the steepness of slopes causes rapid to very rapid runoff and a high erosion hazard. Because of its coarse texture and high rate of dispersion, sand is washed from the gullies in large amounts and deposited on flood plains. The damage caused by this sedimentation on the flood plains is severe in places. Also, because channels are clogged by sediment washed from the sandy gullies, the flood hazard is more severe.

Further erosion of this land can be controlled with perennial plants. Loblolly and shortleaf pines are suited. Loblolly pines are most suitable, however, because they grow more rapidly and the fallen needles produce a greater amount of cover. Under good management, fair yields of pulpwood and sawlogs can be produced, and the soil material can also be stabilized. (Capability unit VIIe–3; woodland suitability group 12)

Gullied Land, Silty

Gullied land, silty (Gu) consists of land so severely eroded that in many places the soil cannot be identified. Slopes range from 2 to 25 percent. Nearly all the original surface layer and in places much of the subsoil have been washed away, and an intricate pattern of shallow and deep gullies has been formed.

Originally, these areas were made up of Memphis and Grenada soils. But because these soils were not protected, they have been so eroded that it is not generally feasible to use or reclaim them for row crops or pasture.

The soil material in this mapping unit is generally acid. In some deep gullies in the western part of the county, however, the material is alkaline. The texture ranges from silt to silty clay loam. Infiltration is slow, and permeability is generally moderate. The available water capacity and natural fertility are moderate. Runoff is rapid to very rapid. Because of slow infiltration and rapid runoff, the erosion hazard is high. As the soil particles are relatively fine, large amounts that are washed from the gullies remain suspended in the water for long periods. These sediments washed from the gullies have moderate natural fertility and high available water capacity.

Further erosion of this land can be controlled with perennial plants. Loblolly and shortleaf pines are suited. Loblolly pines are best, however, because they grow more rapidly and the fallen needles produce a greater amount of cover. In areas that are neutral to alkaline, hardwoods are best suited. Under good management, fair yields of pulpwood and sawlogs can be produced, and the soil material can also be stabilized. (Capability unit VIIe-3; woodland suitability group 12)

Henry Series

In the Henry series are soils that occur in broad, nearly level areas in the uplands adjacent to the flood plains of major streams and in small depressions scattered throughout the uplands. They are poorly drained soils with a fragipan that generally is less than 15 inches below the surface.

Typical profile—

0 to 4 inches, brown, friable silt loam with brownish-gray mottles and dark-brown concretions.

4 to 12 inches, light brownish-gray silt loam with yellowish-brown mottles and brown concretions; moderate, medium, subangular blocky structure.

12 to 40 inches, light brownish-gray silt loam or heavy silt loam with yellowish-brown mottles that increase in number with depth; dark-brown concretions; firm, compact, and brittle (fragipan).

40 to 52 inches +, light brownish-gray silt loam with yellowish-brown mottles; firm, compact, and brittle (fragipan).

The Henry soils occur throughout the hilly section of the county. The largest areas are northeast of Coldwater. The Henry soils occur with the Memphis, Loring, Grenada, Calloway, Falaya, and Waverly soils. They are more poorly drained than the Memphis, Loring, Grenada, and Calloway soils. They resemble the Waverly soils in color, but those soils lack a fragipan.

The Henry soils are strongly acid. They have a low content of organic matter and low natural fertility. Infiltration and permeability are slow, and the available water capacity is low. The Henry soils are best suited to pasture plants and trees. Drainage is a problem that must be considered if these soils are used for pasture or crops.

Henry silt loam (He).—This is a poorly drained soil on nearly level uplands and in depressions. It has a brown silt loam surface layer about 4 inches thick. The subsoil is gray silt loam or silty clay loam. A fragipan occurs in most places within 15 inches of the surface. Small areas are included in mapping that have a gray subsoil with yellow mottles.

The soil is strongly acid. It contains a small amount of organic matter and has low natural fertility. Water enters the surface soil slowly and moves slowly through the subsoil. The available water capacity is low. The soil is easily worked, but it will crust and pack if left bare. Most areas of this soil have been cleared, and a large acreage is now in pasture. If large applications of fertilizer and adequate drainage are used, the soil produces fair pasture. Runoff is slow, and the removal of surface water is a problem. The erosion hazard is slight. Pasture plants, trees, and a few row crops are suited, but they do not grow well in either wet or dry years. (Capability unit IVw–3; woodland suitability group 5)

Loring Series

In the Loring series are moderately well drained, silty, upland soils that have a fragipan. They are nearly level to gently sloping. The Loring soils formed in thick beds of windblown silt.

Typical profile—

0 to 8 inches, yellowish-brown to brown silt loam; weak, fine, subangular blocky or granular structure.
8 to 21 inches, brown to dark-brown, heavy silt loam that grades to silty clay loam; moderate, medium, subangular blocky structure.
21 to 33 inches, brown to dark-brown silt loam with yellowish-brown and light brownish-gray mottles; moderate, medium, subangular blocky structure.
33 to 60 inches +, mottled dark yellowish-brown, gray, and yellowish-brown silt loam; moderate, medium and coarse, subangular blocky structure; firm, compact, and brittle (fragipan).

The Loring soils occur mostly in the eastern half of the county with the Grenada, Calloway, and Henry soils. They are better drained and have a browner, finer textured subsoil than the Grenada, Calloway, and Henry soils.

The Loring soils are strongly acid. They contain a small amount of organic matter and have moderate natural fertility. Infiltration is slow. Permeability is moderate through the upper part of the subsoil and is slow through the fragipan. The available water capacity is moderate to high. These soils are suited to nearly all commonly grown row crops and to pasture and trees. Erosion is a hazard in the sloping areas.

In Tate County, Loring soils are mapped only in a complex with Grenada soils.

Loring-Grenada silt loams, 0 to 2 percent slopes (LgA).—This mapping unit occurs mainly adjacent to the flood plains of the larger streams of the county. It consists of areas of Loring and Grenada soils that are so intermingled that they cannot be shown separately on a map of the scale used. The acreage of the two soils is about equal in most of the mapped areas. Areas are no larger than surrounding mapped areas of single soils. A few small areas of somewhat poorly drained soils were included in mapping.

The Loring soils of this complex are generally at the top of the ridges and in small areas that have a slight rise in elevation. They are moderately well drained to well drained. They have a brown silt loam surface layer about 6 inches thick and a brown to dark-brown silty clay loam subsoil. A fragipan occurs in most places at a depth of 30 inches or more, but the depth may be less than 30 inches in some small areas. The underlying material is brown with gray mottles. It has silt coatings in cracks and on peds.

The Loring soils are strongly acid. They contain a small amount of organic matter and have moderate natural fertility. Water enters the surface soil slowly and moves at a moderate rate through the upper part of the subsoil but slowly through the fragipan. The available water capacity is moderate.

The Grenada soils in this complex occur on ridgetops. They are moderately well drained and have a brown silt loam surface layer over a dark yellowish-brown silt loam or heavy silt loam subsoil. A gray and brown, mottled silt loam fragipan occurs at a depth of about 25 inches and is several feet thick in most places.

The Grenada soils are strongly acid. They contain a small amount of organic matter and have low natural fertility. Water enters the surface soil slowly and moves at a moderate rate through the upper part of the subsoil and slowly through the fragipan. The available water capacity is moderate.

The soils of this complex are suited to most crops commonly grown in the areas. Crops respond well to management, including applications of fertilizer. The soils are easily worked, but they crust and pack if left bare. A plowpan forms readily. (Capability unit IIw–2; woodland suitability group 8)

Loring-Grenada silt loams, 2 to 5 percent slopes (LgB).—This mapping unit occurs mainly in the eastern half of the county. It consists of areas of Loring and Grenada soils that are so intermingled that they cannot be shown separately on a map of the scale used. The acreage of the two soils is about equal in most, but not all, of the mapped areas. These areas are no larger than surrounding mapped areas of single soils. A few small areas of somewhat poorly drained soils were included in mapping.

The Loring soils of this complex generally are at the top of the ridges and in small areas that have a slight rise in elevation. They are moderately well drained to well drained. They have a brown silt loam surface layer about 5 to 8 inches thick over a brown to dark-brown silty clay loam subsoil. A fragipan occurs in most places at a depth of 30 inches or more, but the depth may be less than 30 inches in some places. The underlying material is brown

and has gray mottles. It has silt coatings in cracks and on peds.

The Loring soils are strongly acid. They contain a small amount of organic matter and have moderate natural fertility. Water enters the surface soil slowly and moves at a moderate rate through the upper part of the subsoil and slowly through the fragipan. The available water capacity is moderate to high.

The Grenada soils in this complex occur on ridgetops. They are moderately well drained and have a brown silt loam surface layer about 5 to 8 inches thick. The subsoil is a dark yellowish-brown silt loam or heavy silt loam. A gray and brown mottled fragipan occurs at a depth of about 25 inches and in most places is several feet thick.

The Grenada soils are strongly acid. They contain a small amount of organic matter and have moderate to low natural fertility. Water enters the surface soil slowly and moves at a moderate rate through the upper part of the subsoil and slowly through the fragipan. The available water capacity is moderate.

Much of the acreage in this complex is used for crops and pasture. Crops respond well to good management, including applications of fertilizer. The soils are easily worked, but they crust and pack if left bare. (Capability unit IIe-2; woodland suitability group 8)

Loring-Grenada silt loams, 2 to 5 percent slopes, eroded (LgB2).—This mapping unit occurs mainly in the eastern half of the county. It consists of areas of Loring and Grenada soils that are so intermingled that they cannot be shown separately on a map of the scale used. The acreage of the two soils is about equal in most, but not all, of the mapped areas. These areas are no larger than surrounding mapped areas of single soils. A few small areas of somewhat poorly drained soils are included in mapping.

In a few places erosion has exposed the subsoil material. In some places, rills and a few shallow gullies are common.

The Loring soils of this complex generally are at the top of the ridges and in small areas that are on slight elevations. They are moderately well drained to well drained. They have a brown silt loam surface layer about 2 to 5 inches thick. The subsoil is brown to dark-brown silty clay loam. A fragipan occurs at a depth below 30 inches in most places, but the depth may be less than 30 inches in some areas. The underlying material is brown and has gray mottles. It has silt coatings in cracks and on peds.

The Loring soils are strongly acid. They contain a small amount of organic matter and have moderate natural fertility. Water enters the surface soil slowly and moves at a moderate rate through the upper part of the subsoil and slowly through the fragipan. The available water capacity is moderate.

The Grenada soils of this complex occur on ridgetops. They are moderately well drained and have a brown silt loam surface layer about 3 inches thick. The subsoil is dark yellowish-brown silt loam. A gray-and-brown mottled silt loam fragipan occurs at a depth of about 25 inches, and in most places it is several feet thick.

The Grenada soils are strongly acid. They contain a small amount of organic matter and have moderate to low natural fertility. Water enters the surface soil slowly and moves at a moderate rate through the upper part of the subsoil and slowly through the fragipan. The available water capacity is moderate.

Most of the acreage in this complex is used for pasture and crops. If good management, including large applications of fertilizer, is used, the soils produce good yields of most of the crops commonly grown. The soils are easily worked, but they crust and pack if left bare. The erosion hazard is moderate if the soils are cultivated. (Capability unit IIe-2; woodland suitability group 8)

Loring-Grenada silt loams, 2 to 5 percent slopes, severely eroded (LgB3).—This mapping unit occurs in the eastern half of the county. It consists of areas of Loring and Grenada soils that are so intermingled that they cannot be shown separately on a map of the scale used. The acreage of the two soils is about equal in most, but not all, of the mapped areas. These areas are no larger than surrounding mapped areas of single soils.

The brown silt loam surface layer of the soils of this complex consists of a mixture of subsoil material and remnants of the original surface soil. The yellowish-brown to dark-brown subsoil is exposed in most places. These places are interspersed with occasional areas of the original brown surface soil. Shallow gullies or a few deep ones are common.

The Loring soils of this complex generally are at the top of the ridges and in small areas that are at slightly higher elevations. They are moderately well drained to well drained and have a brown silt loam surface layer and a brown to dark-brown silty clay loam subsoil. A fragipan occurs at a depth below 28 inches in most places, but the depth may be less than 28 inches in some places. The underlying material is brown and has gray mottles. It has silt coatings in cracks and on peds.

The Loring soils are strongly acid. They contain a small amount of organic matter and have moderate natural fertility. Water enters the surface soil slowly and moves at a moderate rate through the upper part of the subsoil and slowly through the fragipan. The available water capacity is moderate to high.

The Grenada soils of this complex occur on ridgetops and are intermingled with about equal parts of Loring soils. They are moderately well drained and have a dark yellowish-brown silt loam surface layer. The subsoil is dark yellowish-brown silt loam. A gray-and-brown mottled fragipan occurs at a depth of about 20 inches, and in most places it is several feet thick.

The Grenada soils are strongly acid. They contain a small amount of organic matter and have low natural fertility. Water enters the surface soil slowly and moves at a moderate rate through the upper part of the subsoil and slowly through the fragipan. The available water capacity is moderate.

Most of the acreage in this complex has been cleared and used for row crops. The acreage is now used chiefly for pasture and trees, but a few acres are used for row crops. If large applications of fertilizer are used, the soils of this complex produce good yields of the commonly grown crops and pasture. If the soils are used for row crops, the erosion hazard is high. (Capability unit IIIe-2; woodland suitability group 8)

Made Land

Made land (Ma) consists of poorly drained, clayey areas that have slopes of about 8 to 12 percent. These are areas of spoil and of material removed from the old Coldwater River channel. The texture ranges from silty clay loam

to clay, and the color ranges from yellowish brown to black. Clay is the texture most common. There has been no profile development.

Made land occurs only on the extreme western edge of the county in places along the Coldwater River. It occurs with the Alligator, Dowling, and Dundee soils, but it is easily distinguished from these soils by its steeper slopes. The areas vary in size, but in most places they are in elongated strips about 50 to 200 feet wide and about 1/10 to 1/4 mile long.

Some areas that have slopes of about 10 percent are being cultivated. Generally they are used for small grain, but occasionally they are planted to cotton. (Capability unit IIIs–1; woodland suitability group 13)

Memphis Series

The Memphis soils are deep, well-drained, silty soils in the uplands. They have gentle to very steep slopes. Memphis soils have formed in thick beds of windblown silt.

Typical profile—

- 0 to 13 inches, brown to dark-brown, friable silt loam; weak, fine, granular or subangular blocky structure.
- 13 to 31 inches, brown to dark-brown heavy silt loam to silty clay loam; moderate, fine and medium, subangular blocky structure.
- 31 to 60 inches +, brown silt loam; moderate, medium, subangular blocky structure.

The Memphis soils are mainly on uplands in the western half of the county, but not on the Delta. They occur with Natchez, Loring, Grenada, Calloway, and Henry soils. The Memphis soils are browner and better drained than the Loring, Grenada, Calloway, and Henry soils, and they do not have the fragipan that is characteristic of these soils. The Memphis soils have stronger profile development than the Natchez and are more acid at lower depths.

The Memphis soils are strongly acid to medium acid. They contain a small amount of organic matter and have moderate natural fertility. Infiltration is slow and permeability is moderate. These soils have high available water capacity. They are suited to all commonly grown row crops and to pasture and trees. Erosion is a hazard on these soils.

Memphis silt loam, 2 to 5 percent slopes, eroded (MeB2).—This is a deep, well-drained soil. It has a brown to dark-brown silt loam surface layer about 5 inches thick. In a few eroded places the subsoil material is exposed. Also, in some areas rills and a few shallow gullies are common. The subsoil is brown to dark-brown silty clay loam or heavy silt loam to a depth of about 40 inches. The underlying material is dark yellowish-brown silt loam. Soils that have a fragipan (Loring) make up about 2 to 5 percent of areas mapped as this soil. Also, a few small areas are included that have a dark grayish-brown surface soil as much as 8 inches thick.

The soil is strongly acid to medium acid. It has moderate natural fertility and contains a small amount of organic matter. Water enters the surface slowly and moves through the soil at a moderate rate. The available water capacity is high.

Most areas of this soil have been cleared and now are used for row crops and pasture. If large applications of fertilizer are used, the soil produces high yields of row and forage crops. (Capability unit IIe–1; woodland suitability group 15)

Memphis silt loam, 2 to 5 percent slopes, severely eroded (MeB3).—This is a deep, well-drained, acid soil in the uplands. It has a dark-brown or dark yellowish-brown silt loam surface layer that consists of a mixture of the subsoil material and remnants of the original surface layer. Areas of brown to dark-brown subsoil are now exposed in most places and are interspersed with scattered patches that have the original brown surface soil. Also, shallow gullies or a few deep ones are common. The subsoil is brown to dark-brown silty clay loam or heavy silt loam to a depth of about 35 inches. The underlying material is silt loam. Soils that have a fragipan (Loring) make up about 2 to 5 percent of areas mapped as this soil. Also, a few small areas are included that have a silty clay loam surface layer.

This soil has moderate natural fertility and contains a small amount of organic matter. It has slow infiltration and moderate permeability. The available water capacity is high.

Most areas of this soil have been cleared and cultivated, but a large acreage is now in pasture.

If large applications of fertilizer and lime are used, this soil produces moderate to high yields of all crops commonly grown. If the soil is cultivated, a cover should be maintained as much of the time as feasible to help prevent crusting and packing and to increase infiltration. (Capability unit IIIe–1; woodland suitability group 15)

Memphis silt loam, 5 to 8 percent slopes, eroded (MeC2).—This is a deep, well-drained soil in the uplands. It has a brown silt loam surface layer 2 to 5 inches thick. In a few areas subsoil material is exposed, and some fields have a few small gullies or rills. The subsoil is brown to dark-brown silty clay loam or heavy silt loam to a depth of about 35 inches. The underlying material is generally yellowish-brown silt loam. Soils that have a fragipan (Loring) make up about 2 to 5 percent of areas mapped as this soil. Also, uneroded soils that have a brown or grayish-brown surface layer about 5 to 8 inches thick make up about 12 percent.

This medium acid to strongly acid soil has moderate natural fertility and contains a small amount of organic matter. Water enters the surface slowly and moves through the soil at a moderate rate. The available water capacity is high.

Except for the included uneroded areas, which are mainly in hardwoods, most areas of this soil have been cleared and cultivated. A large part of the acreage is now in pasture. If large applications of fertilizer and lime are used, this soil produces moderate to high yields of all crops commonly grown. Runoff is moderate to rapid. The erosion hazard is moderate to high when the soil is cultivated. If this soil is cultivated, a cover should be maintained as much of the time as feasible to reduce crusting and packing and to increase infiltration. (Capability unit IIIe–1; woodland suitability group 15)

Memphis silt loam, 5 to 8 percent slopes, severely eroded (MeC3).—This is a deep, well-drained soil. It has a brown to dark-brown silt loam surface layer that consists of a mixture of subsoil material and remnants of the original surface soil. Areas of brown to dark-brown subsoil are now exposed in most places and are interspersed with scattered patches that have the original surface soil. Shallow gullies or a few deep ones are common. The subsoil is brown to dark-brown heavy silt loam or silty clay

loam to a depth of about 35 inches. The underlying material is silt loam. Soils that have a fragipan (Loring) make up about 2 to 5 percent of areas mapped as this soil. Also small patches are included that have a silty clay loam surface layer.

This soil is medium acid to strongly acid. It has moderate natural fertility and contains a small amount of organic matter. Water enters the surface slowly and moves at a moderate rate through the soil. The available water capacity is high.

Nearly all the acreage of this soil has been cleared and cultivated. Much of it now is pastured. If large applications of fertilizer and lime are used, this soil produces moderate yields of the commonly grown forage and row crops. Runoff is moderate to rapid. If the soil is cultivated, a cover should be maintained to reduce crusting and packing and to increase infiltration. The erosion hazard is severe in cultivated areas. (Capability unit IIIe–1; woodland suitability group 15)

Memphis silt loam, 8 to 12 percent slopes, eroded (MeD2).—This is a deep, well-drained soil. It has a dark-brown to dark grayish-brown silt loam surface layer about 2 to 5 inches thick. In a few areas subsoil material is exposed, and some fields contain a few small gullies or rills. The subsoil is brown to dark-brown heavy silt loam or silty clay loam to a depth of about 35 inches. The underlying material is silt loam. A few small areas of soils that have a fragipan (Loring) are included in mapped areas in the central part of the county. Also, about 17 percent of the acreage mapped as this soil consists of uneroded soils that have about 5 to 8 inches of their original surface layer.

This soil is medium acid to strongly acid. It has moderate natural fertility and contains a small amount of organic matter. Infiltration is slow, permeability is moderate, and the available water capacity is high.

Part of the acreage was cleared and cultivated, but most of it is now used mainly for pasture. The included uneroded areas have remained in hardwoods. If large applications of fertilizer and lime are used, this soil produces good yields of the commonly grown row crops and forage crops. Because of the rapid runoff, the slope, and the erosion hazard, however, this soil is best suited to pasture and trees. (Capability unit IVe–1; woodland suitability group 15)

Memphis silt loam, 8 to 12 percent slopes, severely eroded (MeD3).—This is a deep, well-drained soil. It has a brown to dark-brown silt loam surface layer that consists of a mixture of subsoil material and remnants of the original surface soil. Shallow gullies or a few deep ones are common. Areas of brown to dark-brown subsoil are exposed in most places and are interspersed with scattered patches that have the original surface soil. The subsoil is brown to dark-brown heavy silt loam or silty clay loam to a depth of about 30 inches. The underlying material is silt loam. Soils that have a fragipan (Loring) make up about 2 to 5 percent of mapped areas along the eastern edge of the Memphis soil association near the central part of the county. Also, small patches are included that have a silty clay loam surface layer.

This soil is moderately acid to strongly acid. It contains a small amount of organic matter and has moderate natural fertility. Water enters the surface slowly and moves through the soil at a moderate rate. The available water capacity is moderate to high.

All the acreage of this soil has been cleared and cultivated, but now a large part is in pine trees and pasture. If large applications of fertilizer and lime are used, this soil produces good yields of row crops and forage crops. Because of the slope and the erosion hazard, however, it is best suited to pasture or trees. (Capability unit IVe–1; woodland suitability group 15)

Memphis silt loam, 12 to 17 percent slopes, eroded (MeE2).—This is a deep, well-drained soil in the uplands. It has a dark grayish-brown silt loam surface layer about 2 to 8 inches thick. In a few places the subsoil material is exposed. Some mapped areas have a few small gullies or rills. The subsoil is brown to dark-brown heavy silt loam or silty clay loam to a depth of about 35 inches. The underlying material is silt loam. Included in mapped areas are small patches near the bluffs that are neutral to alkaline and have a lighter colored silt loam subsoil.

This soil is strongly acid to medium acid. Natural fertility is moderate. The available water capacity is moderate to high. Water enters the surface slowly and moves through the soil at a moderate rate.

Most areas of this soil have never been cleared and cultivated, but some are in pasture. If large applications of fertilizer are used, this soil produces good yields of forage crops. Runoff is rapid. Because of the slope and the erosion hazard, this soil is not suited to row crops. (Capability unit VIe–1; woodland suitability group 9)

Memphis silt loam, 12 to 17 percent slopes, severely eroded (MeE3).—This is a deep, well-drained soil in the uplands. It has a brown to dark-brown surface layer that consists of a mixture of subsoil material and remnants of the original surface soil. Areas of brown to dark-brown subsoil are exposed in most places and are interspersed with scattered patches of the original surface soil. Shallow gullies or a few deep ones are common. The subsoil is brown to dark-brown heavy silt loam or silty clay loam to a depth of about 30 inches. The underlying material is silt loam. Included in mapped areas are small patches that have a silty clay loam surface layer. Also included in a few places near the bluffs are small areas that are neutral to alkaline and have a lighter colored silt loam subsoil.

This soil is strongly acid to medium acid and has moderate natural fertility. It contains a small amount of organic matter. Infiltration is slow and permeability is moderate. The available water capacity is moderate to high.

All the acreage of this soil has been cleared and cultivated. Now much of it is in pasture, and a large part is reverting to woods. If large applications of fertilizer and lime are used, this soil produces high yields of forage plants. Because of the slope and the high erosion hazard, this soil is not suited to row crops. (Capability unit VIe–1; woodland suitability group 9)

Memphis silt loam, 17 to 45 percent slopes (MeF).—This is a deep, well-drained soil in the uplands. It has a dark grayish-brown silt loam surface layer about 2 to 8 inches thick. In a few areas subsoil material is exposed. Some mapped areas have a few small gullies or rills. The subsoil is brown to dark-brown heavy silt loam or silty clay loam to a depth of about 35 inches. The underlying material is silt loam. Included in mapping are small patches near the bluffs that are neutral to alkaline and have

a lighter colored silt loam subsoil.

This soil is strongly acid to medium acid and has moderate natural fertility. It has a moderate to high available water capacity. Water enters the surface slowly and moves at a moderate rate through the soil.

Except for a few acres of pasture that have been managed well, all of this soil has remained as woodland. If this soil is carefully managed and large applications of fertilizer are used, it produces good yields of forage crops. Runoff is rapid. Because of the slope and the erosion hazard, this soil is not suited to row crops, but trees and pasture plants grow well. (Capability unit VIe–1; woodland suitability group 14)

Memphis silt loam, 17 to 45 percent slopes, severely eroded (MeF3).—This is a deep, well-drained soil in the uplands. It has a brown to dark-brown silt loam surface layer that is a mixture of subsoil material and remnants of the original surface soil. Areas of brown to dark-brown subsoil are now exposed in most places and are interspersed with scattered patches that have the original surface soil. Shallow gullies or a few deep ones are common. The subsoil is brown to dark-brown heavy silt loam or silty clay loam to a depth of about 30 inches. The underlying material is silt loam. Included in mapped areas are small patches that have a silty clay loam surface layer. Also included are scattered areas near the bluffs that are neutral to alkaline and have a lighter colored silt loam subsoil.

This soil is strongly acid to medium acid and has moderate natural fertility. It contains a small amount of organic matter. Infiltration is slow and permeability is moderate. The available water capacity is moderate to high.

All the acreage of this soil has been cleared and cultivated. Now it is chiefly in pasture but is rapidly reverting to woods. This soil produces good yields of forage crops, but because of the slope and the erosion hazard, it is not suited to row crops or pasture. It is best suited to trees. (Capability unit VIIe–1; woodland suitability group 9)

Memphis-Gullied land complex (Mg).—This complex of soils is well drained. Slopes range from 2 to 17 percent. Gullies that are uncrossable by farm machinery dissect mapped areas at intervals of 50 to 100 feet. In most places the gullied areas make up as much as 50 percent of this mapping unit, but they are not large enough to be mapped separately.

Most of the original surface layer of the Memphis soils was brown to dark-brown silt loam. Now the surface layer consists of brown to dark-brown heavy silt loam to silty clay loam subsoil material. In a few places, remnants of the original surface layer remain. Soils that have a fragipan (Grenada and Loring) make up about 5 percent of the areas mapped as this complex. Also, somewhat excessively drained silt loam soils (Natchez) make up about 2 percent and occur in the western part of the county among the bluffs.

Except for the included Natchez, the soils of this complex are acid. They have moderate natural fertility and contain a small amount of organic matter. The available water capacity is high. Infiltration is slow and permeability is moderate. Runoff is rapid.

Nearly all the acreage has been cleared and cultivated, but now a large part is used for pasture and some is reverting to woodland. If large applications of fertilizer are used, the soils produce moderate yields of sod crops. The use of farm machinery is restricted by many deep gullies. The erosion hazard is high if the soils are left bare. Pasture plants and trees are suited to the soils of this complex. (Capability unit VIe–5; woodland suitability group 9)

Morganfield Series

The Morganfield series consists of well-drained soils that have a dark grayish-brown silt loam surface layer and a yellowish-brown to brown subsoil. These soils have formed in alluvium that washed from the silty loessal uplands of the bluffs.

Typical profile—

0 to 6 inches, dark grayish-brown, very friable, mildly alkaline silt loam.

6 to 25 inches, yellowish-brown to brown, friable silt loam with few yellowish-brown mottles; mildly alkaline.

25 to 48 inches +, brown, friable silt loam with pale-brown and yellowish-brown mottles; neutral.

The Morganfield soils are on the bottom lands in the bluff area of the county. They occur with the Collins, Falaya, Adler, and Wakeland soils. The Morganfield soils are better drained and have less gray mottling in the lower part of their subsoil than any of these soils. Also, the Morganfield soils are slightly acid to mildly alkaline, whereas the Collins and Falaya soils are acid.

The Morganfield soils have moderate natural fertility and contain a small amount of organic matter. They have high available water capacity. Infiltration is slow and permeability is moderate. Flooding is a hazard that must be considered when a water-disposal system and a cropping sequence are planned.

The Morganfield soils are well suited to nearly all commonly grown crops and to pasture and trees. If the flood hazard is reduced or eliminated, the soils are especially well suited to cotton or corn.

In Tate County, Morganfield soils are mapped only as a part of two undifferentiated groups—Adler and Morganfield silt loams (Ag), and Adler and Morganfield silt loams, local alluvium (Am).

Natchez Series

The Natchez series consists of deep, somewhat excessively drained, loessal soils in the uplands. They are on the side slopes in rough, broken areas of the bluffs. The Natchez soils have formed in thick beds of calcareous loess.

Typical profile—

0 to 8 inches, dark grayish-brown to brown or dark-brown, very friable silt loam; weak structure; medium acid.

8 to 26 inches, yellowish-brown to dark yellowish-brown, very friable silt loam; weak, coarse structure; nonplastic; slightly acid.

26 to 48 inches, yellowish-brown, very friable silt loam; structureless; nonplastic; few fine, white nodules of lime; mildly alkaline.

48 to 65 inches +, dark yellowish-brown, very friable silt loam; structureless; nonplastic, few white lime nodules; medium alkaline.

The Natchez soils occur in the bluff area of the county near the Memphis soils. They are similar to the Memphis soils, but are more silty and somewhat lighter colored.

Also, they have less profile development and are less acid in their lower subsoil than the Memphis soils.

The Natchez soils are mildly alkaline below a depth of about 2 feet. They contain a small amount of organic matter and have moderate natural fertility. Infiltration is slow and permeability is moderate. The Natchez soils have high available water capacity. They are suited to pasture plants and hardwoods. They erode rapidly if they are not protected.

In Tate County, Natchez soils are mapped only in complexes consisting of Natchez and Memphis silt loams.

Natchez-Memphis silt loams, 12 to 17 percent slopes (NmE).—This mapping unit is in the western part of the county near the bluffs in steep, rough areas. The soils are chiefly wooded and are on narrow, winding ridgetops and steep side slopes. The Natchez and Memphis soils occur in bands so narrow that they cannot be shown as separate soils on a map of the scale used. Mapped areas of this complex of soils are no larger than surrounding mapped areas of single soils.

The Natchez soils make up about 47 percent of the complex, and the Memphis soils about 43 percent. Inclusions of other soils, such as well-drained gravelly soils and well-drained alkaline soils in narrow drains (Adler), make up the rest. Most areas mapped as this complex contain both of the dominant soils and one or more minor soils. The proportion of soils generally is most uniform.

The Natchez soils occur on the steep side slopes. They are somewhat excessively drained and have formed in thick beds of calcareous loess. They have a dark grayish-brown silt loam surface layer about 8 inches thick that overlies a weakly developed, yellowish-brown silt loam subsoil. The underlying material is yellowish-brown silt loam.

The Natchez soils are mildly alkaline below a depth of about 24 inches. They contain a small amount of organic matter and have moderate natural fertility. Water enters the surface slowly and moves at a moderate rate through the soil. The available water capacity is high.

The Memphis soils in this complex occur on the narrow ridgetops and on the upper part of the side slopes. They have a dark grayish-brown silt loam surface layer 3 to 8 inches thick over a brown heavy silt loam subsoil. The underlying material is yellowish-brown silt loam.

The Memphis soils are acid. They contain a small amount of organic matter and have moderate natural fertility. Water enters the surface slowly and moves at a moderate rate through the soil. The available water capacity is high.

Because of steep slopes, rapid runoff, and high erosion hazard, the soils of this complex should be kept in perennial vegetation to reduce runoff, increase infiltration, and furnish protection from erosion. If carefully managed and adequately fertilized, these soils produce good pasture. (Capability unit VIe–1, both soils; woodland suitability group 14, Natchez silt loam part; woodland suitability group 9, Memphis silt loam part)

Natchez-Memphis silt loams, 17 to 50 percent slopes (NmF).—This mapping unit is in the western part of the county along the bluffs in steep, rough, broken areas. The soils are chiefly wooded and are on narrow, winding ridgetops and very steep side slopes. In places along the bluff, slopes are as much as 100 percent. The Natchez and Memphis soils occur in bands so narrow that they cannot be shown as separate soils on a map of the scale used. Mapped areas of this complex of soils are no larger than surrounding mapped areas of single soils.

The Natchez soils make up about 47 percent of this complex, and the Memphis about 43 percent. Inclusions of other soils, such as well-drained gravelly soils and well-drained alkaline soils in narrow drains (Adler), make up the rest.

Most areas mapped as this complex contain both dominant soils and one or more minor soils. The proportion of soils is generally uniform.

The Natchez soils occur on the very steep side slopes. They are somewhat excessively drained and formed in thick beds of calcareous loess. They have a dark grayish-brown silt loam surface layer about 8 inches thick that overlies a weakly developed, yellowish-brown silt loam subsoil. The underlying material is yellowish-brown silt loam.

The Natchez soils are mildly alkaline below a depth of about 24 inches. They contain a small amount of organic matter and have moderate natural fertility. Water enters the surface slowly and moves at a moderate rate through the soil. The available water capacity is high.

The Memphis soils in this complex occur on the narrow ridgetops and on the upper part of slopes. They have a dark grayish-brown silt loam surface layer 3 to 8 inches thick over a brown heavy silt loam subsoil. The underlying material is yellowish-brown silt loam.

The Memphis soils are acid. They contain a small amount of organic matter and have moderate natural fertility. Water enters the surface slowly and moves at a moderate rate through the soil. The available water capacity is high.

Because of very steep slopes, rapid runoff, and high erosion hazard, the soils of this complex are best suited to perennial vegetation, such as trees or pasture plants. They are not suited to row crops. (Capability unit VIe–1, both soils; woodland suitability group 14, Natchez silt loam part; woodland suitability group 9, Memphis silt loam part)

Providence Series

The soils of the Providence series have strong to very steep slopes. They are moderately well drained soils that formed in a thin mantle of loess over friable, sandy material of the Coastal Plain.

Typical profile—

- 0 to 8 inches, dark grayish-brown to pale-brown, very friable silt loam.
- 8 to 19 inches, brown to dark-brown silty clay loam with yellowish-brown mottles; moderate, medium, subangular blocky structure.
- 19 to 25 inches, brown to dark-brown silt loam with yellowish-brown and gray mottles; moderate, medium, subangular blocky structure.
- 25 to 54 inches +, mottled brown to dark-brown, yellowish-brown, and light-gray fine sandy loam to sandy clay loam; firm, compact, and brittle (fragipan).

The Providence soils occur in the eastern part of the county with the Grenada, Loring, and Ruston soils. They have coarser texture in the lower horizon than the Grenada and Loring soils. Unlike the Ruston soils, the Providence soils have a loess cap about 2 feet thick that is underlain by a fragipan.

The Providence soils are strongly acid. Their organic-matter content is small, and their natural fertility is low to moderate. Infiltration is slow, and permeability is moderate above the fragipan and slow in the pan. The available water capacity is moderate. The Providence soils are well suited to pasture and to trees. If not protected, these soils are easily eroded.

Providence silt loam, 8 to 12 percent slopes, severely eroded (PoD3).—This is a moderately well drained soil in the uplands. It has a dark yellowish-brown silt loam surface layer that consists of a mixture of the subsoil material and remnants of the original surface soil. Shallow gullies and a few deep ones are common. The subsoil is brown to dark-brown silt loam or silty clay loam about 20 inches thick. It is underlain by a brown and gray, mottled fragipan about 2 feet thick. Soils with a sandier profile make up about 2 percent of areas mapped as this soil. Approximately 10 percent of the areas mapped include areas of Providence soils that have about 7 inches of the original dark grayish-brown surface soil.

This soil is strongly acid. It contains a small amount of organic matter and has moderate natural fertility. Water enters the surface layer slowly and moves at a moderate rate through the upper part of the subsoil and slowly through the fragipan. The available water capacity is moderate. If cultivated and left bare, this soil tends to crust and pack.

Nearly all the acreage of this soil has been cleared and cultivated, and much of it still is in crops or pasture. About 10 percent, however, is in pines and hardwoods. If large applications of fertilizer are used, this soil produces good pasture and fair yields of row crops. Runoff is rapid, and if the soil is cultivated, the erosion hazard is high. Pasture plants and pine trees are well suited. (Capability unit VIe–2; woodland suitability group 8)

Providence-Ruston complex, 12 to 17 percent slopes (PrE).—This mapping unit is in the eastern part of the county in steep, rough, broken areas. The soils are chiefly wooded and are on narrow, winding ridgetops and steep side slopes. The Providence and Ruston soils are in bands so narrow that they cannot be shown as separate soils on a map of the scale used. Mapped areas of this complex are no larger than surrounding mapped areas of single soils.

The Providence soils make up about 50 percent of this complex, and the Ruston about 40 percent. Inclusions of other soils make up the rest. Among the inclusions are somewhat excessively drained loamy sands, moderately well drained sandy loams that have a fragipan, and well drained soils in narrow drains. Also included are soils that are similar to Ruston soils but have a thinner subsoil. Most areas of this complex have both of the dominant soils and one or more of the minor soils. The proportion of soils has considerable uniformity.

The Providence soils are on the ridgetops and the upper part of side slopes. They are moderately well drained. These soils formed in a mantle of loess about 2 to 4 feet thick over friable, sandy material of the Coastal Plain. They have a dark grayish-brown silt loam surface layer about 8 inches thick. This layer overlies a brown to dark-brown heavy silt loam or light silty clay loam subsoil. A fragipan, generally about 1 to 3 feet thick, occurs at a depth of about 25 inches. The underlying material is brown to yellowish-red sandy loam or loamy sand mottled with various shades of gray and brown.

The surface layer of the Providence soils in this complex ranges from about 5 to 10 inches in thickness. It ranges from brown to dark grayish brown in color. The subsoil ranges from heavy silt loam to silty clay loam in texture and from dark yellowish brown to dark brown in color. The loess cap ranges from 1½ to 3 feet in thickness. The fragipan, which occurs at a depth of 20 to 30 inches, ranges from 1 to 3 feet in thickness. The underlying material consists of brown to yellowish-red sandy loam or loamy sand that has gray and brown mottles.

The Providence soils are strongly acid. They contain a small to moderate amount of organic matter and have low to moderate natural fertility. Water enters the surface layer slowly and moves at a moderate rate above the fragipan and slowly through it. The available water capacity is moderate.

The Ruston soils of this complex are on the steep middle and lower parts of slopes. The soils have a dark grayish-brown fine sandy loam surface layer about 8 inches thick. This layer overlies about 14 inches of yellowish-red sandy clay loam that grades to strong-brown or yellowish-red sandy loam or loamy sand.

The surface layer ranges from 6 to 11 inches in thickness and from brown to grayish brown in color. The subsoil ranges from heavy sandy loam to sandy clay loam. In some areas the underlying material contains pockets and strata of pale-brown soil material. Sandstone fragments that may measure as much as 1 inch by 6 inches are scattered throughout the profile in some places.

The Ruston soils of this complex are strongly acid. They contain a small amount of organic matter and have moderate natural fertility. Infiltration and permeability are moderately slow. The available water capacity is moderate.

Because of steep slopes and erosion hazard, the soils in this complex are not well suited to pasture. They are well suited to trees. Under careful management, pasture plants can be grown. These soils respond well to applications of fertilizer. (Capability unit VIe–3; woodland suitability group 11)

Providence-Ruston complex, 12 to 17 percent slopes, severely eroded (PrE3).—This mapping unit is in the eastern part of the county in steep, rough areas. The acreage consists chiefly of pastures and pine plantations on narrow, winding ridgetops and steep side slopes. The Providence and Ruston soils are in bands so narrow that they cannot be shown as separate soils on a map of the scale used. Mapped areas of this complex are no larger than surrounding mapped areas of single soils.

Providence soils make up about 50 percent of the complex, and Ruston about 40 percent. Inclusions of other soils make up the rest. Among the inclusions are somewhat excessively drained loamy sands, moderately well drained sandy loams that have a fragipan, and well drained soils in narrow drains. Also included are soils that are similar to the Ruston soils and that have a thinner subsoil. Most areas of this complex have both of the dominant soils and one or more of the minor soils. The proportion of soils has considerable uniformity.

The Providence soils are on the ridgetops and the upper part of side slopes. They are moderately well drained. They formed in a mantle of loess about 2 to 4 feet thick over friable, sandy Coastal Plain material. The surface layer is brown or dark yellowish-brown silt loam to light

silty clay loam. It consists of a mixture of subsoil material and remnants of the original surface soil. Areas of brown to dark yellowish-brown subsoil material are exposed in most places and are interspersed with occasional patches that have the original dark grayish-brown surface soil. Shallow gullies and a few deep ones are common. The upper part of the subsoil is brown silt loam or silty clay loam that is underlain by a gray and brown, mottled fragipan at a depth of about 20 inches. The fragipan ranges from 1 to 3 feet in thickness and generally becomes sandier and redder with depth. The underlying material is brown to yellowish-red sandy loam to loamy sand mottled with various shades of gray and brown.

The Providence soils are strongly acid. They contain a small amount of organic matter and have moderate natural fertility. Water enters the surface slowly and moves at a moderate rate above the fragipan and slowly through it. The available water capacity is moderate.

The Ruston soils of this complex are on the steep middle and lower parts of slopes. These well-drained soils formed in friable, sandy Coastal Plain material. Areas of the strong-brown to yellowish-red subsoil material are exposed in most places and are interspersed with occasional patches that have the original brown surface soil. Shallow gullies and a few deep ones are common.

The subsoil is yellowish-red sandy clay loam or heavy sandy loam to a depth of about 28 inches. The underlying material is yellowish-red to strong-brown sandy loam to loamy sand that has streaks and pockets of very pale-brown sand and loamy sand. In some places sandstone fragments occur throughout the profile.

The Ruston soils of this complex are strongly acid. They contain a small amount of organic matter and have moderate natural fertility. Infiltration and permeability are moderately slow, and the available water capacity is moderate.

Because of the steep slope and high erosion hazard, the soils of this complex are not well suited to pasture. They are well suited to trees. Under proper management, pasture plants can be grown, and they respond well to applications of fertilizer. (Capability unit VIIe-2; woodland suitability group 11)

Ruston Series

The Ruston series consists of deep, well-drained soils in the uplands. These soils are on steep to very steep side slopes in rough, broken areas. They developed in sandy materials of the Coastal Plain.

Typical profile—

0 to 9 inches, brown to yellowish-red very fine sandy loam.
9 to 17 inches, yellowish-red sandy clay loam; weak, medium, subangular blocky structure.
17 to 48 inches, yellowish-red fine sandy loam; weak, medium, subangular blocky structure.
48 to 66 inches +, yellowish-red loamy sand; structureless.

The Ruston soils occur in the eastern part of the county near the Providence soils. They are better drained, sandier, and redder than the Providence soils and do not have the loess cap and fragipan that characterize those soils.

The Ruston soils are strongly acid. They contain a small amount of organic matter and have low natural fertility. Infiltration and permeability are moderately slow, and the available water capacity is moderate. The Ruston soils are well suited to pasture and trees. Erosion is a major hazard.

In this county Ruston soils are mapped only in a complex with Providence soils.

Ruston-Providence complex, 17 to 50 percent slopes (RpF).—This mapping unit is in the eastern part of the county in very steep, rough, broken areas. The soils occur on narrow, winding ridgetops and very steep side slopes and are mainly wooded. The Ruston and Providence soils are in bands so narrow that they cannot be shown as separate soils on a map of the scale used. Mapped areas are no larger than the surrounding mapped areas of single soils.

The Ruston soils make up about 52 percent of the complex, and the Providence about 33 percent. Inclusions of other soils make up the rest. Among the inclusions are somewhat excessively drained loamy sands, moderately well drained sandy loams that have a fragipan, and well drained soils in narrow drains. Also included are soils that are similar to the Ruston but that have a thinner subsoil. Most areas of this complex have both of the dominant soils and one or more of the minor ones. The proportion of soils has considerable uniformity.

The Ruston soils of this complex are on the very steep side slopes. They have a brown fine sandy loam surface layer about 6 inches thick. This layer overlies yellowish-red sandy loam or sandy clay loam about 20 inches thick that grades to loamy sand or sand and that has streaks and pockets of very pale brown sand. In some places sandstone fragments occur throughout the profile.

The surface layer of Ruston soils ranges from 6 to 11 inches in thickness and from brown to grayish brown in color. The subsoil ranges from heavy sandy loam to sandy clay loam in texture. In some areas the underlying material contains pockets and strata of pale-brown sand. Sandstone fragments that may measure as much as 1 inch by 6 inches are scattered throughout the profile.

The Ruston soils are strongly acid. They contain a small amount of organic matter and have low natural fertility. Infiltration and permeability are moderately slow, and the available water capacity is moderate.

The Providence soils in this complex are on the narrow ridgetops and on the upper part of side slopes. They are moderately well drained. These soils formed in a mantle of loess about 2 to 4 feet thick over friable, sandy material of the Coastal Plain. They have a dark grayish-brown silt loam surface layer about 8 inches thick. This layer overlies brown to dark-brown heavy silt loam or light silty clay loam. A fragipan occurs at a depth of about 25 inches and ranges from 1 to 3 feet in thickness. The underlying material is brown to yellowish-red sandy loam or loamy sand mottled with various shades of gray and brown.

The surface layer of the Providence soils ranges from about 5 to 10 inches in thickness and from brown to dark grayish brown in color. The subsoil ranges from heavy silt loam to silty clay loam in texture and from dark yellowish brown to dark brown in color. The loess cap ranges from 1½ to 3 feet in thickness. The fragipan occurs at a depth of about 20 to 30 inches and ranges from 1 to 3 feet in thickness. The underlying material ranges from brown to yellowish-red sandy loam or loamy sand that is mottled with various shades of gray and brown.

The Providence soils are strongly acid. They contain a small amount of organic matter and have low to moderate natural fertility. Water enters the surface slowly and moves at a moderate rate above the fragipan and slowly through it. The available water capacity is moderate.

Because of the very steep slopes and high erosion hazard, the soils of the Ruston-Providence complex are not suitable for pasture. They are suited to trees, but if they are carefully managed and adequately fertilized, they can be used for pasture. (Capability unit VIIe-2; woodland suitability group 11)

Smoothed Silty Land

Smoothed silty land (Sm) consists of areas that were gullied and have been reclaimed by smoothing. Most areas have slopes of 8 to 17 percent. These areas are mainly in the western half of the county and were originally Memphis soils. Because of cutting and filling, however, most of the original soil profile has been disturbed. The depth of cuts ranged from a few inches in less severely eroded areas to several feet where gullies were deep. In some areas there are small patches that have the original surface layer. In most areas the soil material is brown to dark-brown silt loam or silty clay loam.

Most of the soil material is acid, but a few small areas of included soils in the extreme western part of the hilly section are alkaline. Smoothed silty land contains a small amount of organic matter and has moderate natural fertility. Water enters the surface slowly and moves at a moderate rate through the soil mass. The available water capacity is moderate. Runoff in most places is rapid.

Intensive management is required in these reclaimed areas. A good sod should be established as soon as possible and should be maintained. The erosion hazard and difficulty of establishing adequate cover on slopes greater than 17 percent are so great that the economic feasibility of reclaiming such land for agricultural use is questionable.

If large applications of fertilizer are used, this land type produces good yields of pasture and other forage crops. It is not suited to row crops. Its best agricultural use is for pasture or for trees. (Capability unit VIe-4; woodland suitability group 9)

Wakeland Series

In the Wakeland series are somewhat poorly drained soils that have a brown, friable silt loam surface layer and subsoil. The soils have formed in alluvium that washed from loessal uplands of the bluffs.

Typical profile—

- 0 to 11 inches, brown to dark yellowish-brown, very friable silt loam; slightly acid.
- 11 to 17 inches, light brownish-gray silt loam with brown mottles; slightly acid.
- 17 to 25 inches, mottled grayish-brown and brown to dark-brown silt loam; neutral.
- 25 to 45 inches +, mottled gray and yellowish-brown silt loam; mildly alkaline.

The Wakeland soils are on bottom lands in the bluff area of the county. They occur with the Adler, Collins, Falaya, and Morganfield soils. The Wakeland soils are not so well drained as the Adler, Collins, and Morganfield soils. They are similar to Falaya soils in color, texture, and drainage, but unlike those soils, the Wakeland are slightly acid to alkaline at a depth of about 20 inches.

The Wakeland soils are slightly acid to mildly alkaline. They contain a small amount of organic matter and have moderate natural fertility. Infiltration and permeability are moderately slow, and the available water capacity is high. If an adequate water-disposal system is used, these soils are suited to most crops commonly grown in the county.

Wakeland silt loam (Wk).—This is a somewhat poorly drained, nearly level soil that has formed in silty alluvium. It has a brown silt loam surface layer about 8 inches thick. The underlying material is brown and gray and has gray mottles 6 to 18 inches below the surface. Moderately well drained soils (Adler) make up about 5 percent of areas mapped as this soil.

This soil is slightly acid to mildly alkaline and needs no lime. It contains a small amount of organic matter and has moderate natural fertility. Crops on this soil respond well to fertilizer. Water enters the surface and passes through the soil at a moderate rate. The available water capacity is high.

Most areas of this soil have been cleared and are used for crops and pasture. If large applications of fertilizer and adequate drainage are used, this soil produces high yields of all crops commonly grown. A cover should be maintained as much of the time as feasible to reduce crusting and packing. If the soil is cultivated, a plowpan is likely to form. (Capability unit IIw-4; woodland suitability group 3)

Waverly Series

In the Waverly series are poorly drained soils that are in depressions and on nearly level flood plains. Gray mottles are within about 6 inches of the surface. The Waverly soils have formed in silty alluvium.

Typical profile—

- 0 to 10 inches, grayish-brown to gray silt loam; dark-brown mottles and brown concretions.
- 10 to 39 inches, mottled gray and brown silt loam with soft black concretions.
- 39 to 50 inches +, gray silt loam with streaks and pockets of strong brown.

The Waverly soils occur in small areas throughout the bottom lands of Tate County. They occur with the Collins and Falaya soils, but are more poorly drained than either.

These soils are acid and contain a small amount of organic matter. The natural fertility is moderate. Infiltration is slow, permeability is moderate, and the available water capacity is high. If they are adequately drained, these soils are suited to pasture plants, crops, and hardwoods.

Waverly silt loam (Wv).—This is a poorly drained, nearly level soil on bottom lands or in depressions. It has a mottled gray and brown silt loam surface layer about 3 inches thick. The underlying material is gray silt loam that has brown mottles. Somewhat poorly drained soils (Falaya) make up about 5 percent of areas mapped as this soil. Also, small areas near the bluffs that are neutral to alkaline are included.

This soil is acid. It contains a small amount of organic matter and has moderate natural fertility. Infiltration is

slow and permeability is moderate. The available water capacity is high.

Some of the acreage has been cleared and is used for soybeans and for pasture, but a large part is in hardwoods. If adequately drained and fertilized, this soil produces good pasture. It is not well suited to row crops because of the risk of damage from flooding. It is best suited to hardwoods and summer pasture plants. (Capability unit IVw-2; woodland suitability group 10)

Use and Management of Soils

The use and management of soils in Tate County for crops and pasture, for woodland, for recreation, for wildlife, and for use in engineering structures are discussed in this section.

Management of Soils for Crops and Pasture [2]

This subsection consists of four main parts. In the first part, some general management practices are discussed. In the second part, the capability classification system used by the Soil Conservation Service is explained and the capability units used in Tate County are briefly defined. In the third part, the soils in the county are placed in capability units, and the use and management of each unit is discussed. In the fourth part, a table lists estimated yields for each soil in the county under two levels of management.

General practices of soil management

The chief problems of those who use the soils of Tate County are (1) maintaining adequate fertility, (2) increasing the content of organic matter, (3) using suitable cropping systems and good methods of tillage, (4) providing adequate drainage with good outlets, and (5) controlling soil erosion. Practices that protect the soils from erosion and provide adequate drainage are probably the most important, because many of the soils in the county require this protection and many are not drained well enough for intensive use. Several good farming practices, however, accomplish more than one purpose and can be used on most of the cropland in the county. In the following paragraphs, the main practices that are used in managing the soils of Tate County are discussed.

Maintaining fertility.—Most of the soils in Tate County naturally have a small to moderate amount of plant nutrients, and most of them are acid. The essential plant nutrients can be added to the soil as fertilizer, and the acidity can be corrected by adding lime. Most farmers apply enough fertilizer and lime to obtain fair to good yields of cultivated crops. Also, many farmers apply enough lime and fertilizer to get good yields of pasture.

Soil tests should be used to determine the acidity of the specified soil and its content of essential plant nutrients. With the results of soil tests, agricultural workers can determine the kind and amount of fertilizer and lime needed to grow a specific crop. Because the fertilizer needs of different crops and the plant nutrients in different kinds of soil vary, no specific suggestions for liming and fertilizing soils are given in this report.

Use of suitable cropping systems and tillage.—Some soils in the county erode if used for row crops; others can produce them continuously without erosion. Therefore, several kinds of cropping sequences are necessary. An example of a good cropping sequence for each soil is given in the section "Management of soils by capability units."

On all cropland the content of organic matter can be maintained by using close-growing crops and sod crops in the cropping system. Crop residue, such as the stalks of corn or cotton, should be shredded and left on the surface.

Tillage should be on the contour, and the grade of the furrows between rows should be enough to carry excess water to an outlet without causing erosion.

In most soils of the county, particularly those of the bottom lands, a plowpan forms readily. This compacted zone is about 2 to 4 inches thick and generally about 6 to 8 inches below the surface. It is caused by heavy equipment, such as breaking plows, that plow at the same depth year after year. Tillage when the soils are wet also causes a plowpan. A plowpan should not be confused with a fragipan, which occurs naturally, but at a greater depth, in most soils in the county. A plowpan restricts the growth of roots and the movement of water. It can be broken by chiseling when the soil is dry.

A complete fertilizer—one containing nitrogen, phosphorus, and potassium—and lime are needed on most soils to produce high yields of row crops and pastures.

Drainage.—Adequate drainage is needed to grow crops successfully on alluvial soils and on other nearly level soils in the county (fig. 9). Most pasture plants and many other crops grow satisfactorily on the somewhat poorly drained soils, but artificial drainage and a water-disposal system are usually needed to improve pastures. If the poorly drained soils were adequately drained and fertilized, they could be farmed more intensively. When these soils are cultivated, the rows should be so arranged that the furrows carry excess water to an outlet, but the grade should not be steep enough to cause erosion. V- or W-ditches located in low areas generally remove any excess water. Field laterals, ditches, and canals must be kept clear of brush and trees to prevent clogging and help reduce the danger of flooding. Diversion terraces are helpful in protecting low-lying soils from surface runoff.

Erosion control.—Soil erosion is a serious problem on most of the uplands in Tate County. Erosion can be controlled on some slopes by using vegetated waterways, stripcropping, contour cultivation, and terraces to lower the amount and velocity of runoff. Proper use of crop residue also helps to control erosion. Where the erosion hazard is severe, permanent vegetation should be grown. A good cropping sequence is needed to control erosion in cultivated fields. Streambank caving is a major cause of soil loss in bottom lands. Streambanks can be protected by mechanical structures (fig. 10) and by kudzu and other vegetation. Use of stabilizing structures along streams is very effective in controlling damage from overfall. Roadbank erosion is also a cause of soil loss. Proper sloping of the bands and establishing permanent vegetation help to control this erosion.

Most soil erosion in Tate County is the result of improper land use. About 22 percent of the acreage has

[2] Technical advice for this subsection was furnished by T. R. TAYLOR, agronomist, Soil Conservation Service.

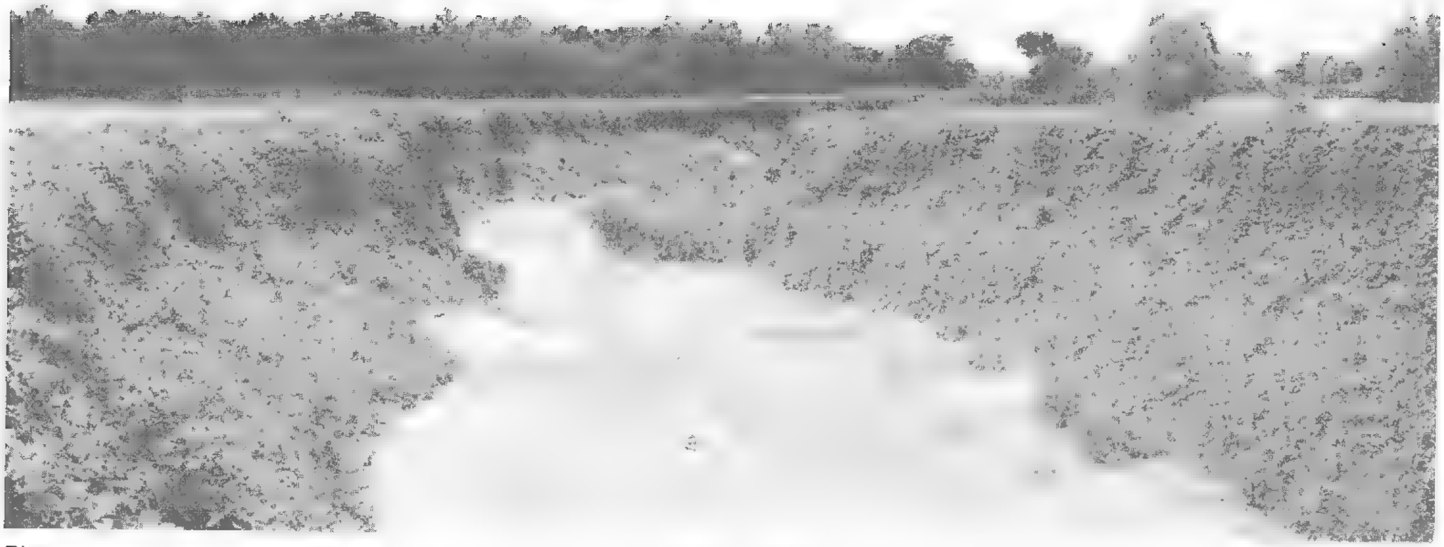

Figure 9.—A large drainage ditch on nearly level land that provides outlets for smaller mains and laterals. The banks are planted to kudzu to protect them from caving and to reduce brushy growth that might clog the ditch and cause flooding.

been severely eroded, 13 percent has been very severely eroded, and 13 percent has been gullied.

Much valuable farmland downstream is covered by sand and silt that is washed from large gullies by runoff. Desilting dams built below the gullied areas reduce the amount of sand that reaches the bottom lands while established trees and other plants heal the gullies.

Capability groups of soils

The capability classification is a grouping of soils that shows, in a general way, how suitable soils are for most kinds of farming. It is a practical grouping based on limitations of the soils, the risk of damage when they are used, and the way they respond to treatment.

In this system all the kinds of soil are grouped at three levels, the capability class, subclass, and unit. Eight capability classes are in the broadest grouping and are designated by Roman numerals I through VIII. In class I are the soils that have few limitations, the widest range of use, and the least risk of damage when they are used. The soils in the other classes have progressively greater natural limitations. In class VIII are soils and landforms so rough, shallow, or otherwise limited that they do not produce worthwhile yields of crops, forage, or wood products. Tate County has no soils in class VIII.

The subclasses indicate major kinds of limitations within the classes. Within most of the classes there can be as many as four subclasses. The subclass is indicated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* means that water in or on the soil will interfere with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the country, indicates that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few or no limitations. Class V can contain, at the most, only subclasses *w*, *s*, and *c*, because the soils in it are subject to little or no erosion but have other limitations that restrict their use largely to pasture, range, woodland, or wildlife.

Within the subclasses are the capability units, groups of soils enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally identified by numbers assigned locally, for example, IIe–1 or IIIe–2.

Soils are classified in capability classes, subclasses, and units according to the degree and kind of their permanent limitations; but without consideration of major and generally expensive landforming that would change the slope, depth, or other characteristics of the soil; and without consideration of possible but unlikely major reclamation projects.

The eight classes in the capability system, and the subclasses and units in this county, are described in the list that follows.

Class I.—Soils that have few limitations that restrict their use.

Capability unit I–1.—Nearly level, well-drained, silty soils on flood plains, subject to slight or no crop damage from flooding.

Figure 10.—Jetties constructed along James Wolf Canal help to prevent streambank caving. At the right, sand is accumulating behind the jetties.

Capability unit I–2.—Nearly level, moderately well drained alluvial soils on old natural terraces of the Delta, subject to slight or no crop damage from flooding.

Class II.—Soils that have some limitations that reduce the choice of plants or require moderate conservation practices.

Subclass IIe.—Soils subject to moderate erosion if they are not protected.

Capability unit IIe–1.—Deep, well-drained, nearly level to gently sloping soils on uplands.

Capability unit IIe–2.—Moderately well drained, gently sloping, medium-textured soils that have a fragipan, on uplands.

Subclass IIw.—Soils that have moderate limitations because of excess water.

Capability unit IIw–1.—Moderately well drained soils on natural levees of the Delta, subject to moderate crop damage from flooding.

Capability unit IIw–2.—Moderately well drained, nearly level, medium-textured soils that have a fragipan, on uplands.

Capability unit IIw–3.—Moderately well drained, dominantly medium-textured soils from loessal alluvium, subject to moderate crop damage from flooding.

Capability unit IIw–4.—Somewhat poorly drained, dominantly medium-textured soils from loessal alluvium, subject to moderate crop damage from flooding.

Capability unit IIw–5.—Somewhat poorly drained, nearly level to gently sloping soils that have a fragipan, on uplands.

Class III.—Soils that have severe limitations that reduce the choice of plants, or require special conservation practices, or both.

Subclass IIIe.—Soils subject to severe erosion if they are cultivated and not protected.

Capability unit IIIe–1.—Deep, well-drained, gently sloping and sloping soils on uplands.

Capability unit IIIe–2.—Moderately well drained, gently sloping, severely eroded soils that have a fragipan, on uplands.

Capability unit IIIe–3.—Moderately well drained, sloping soils that have a fragipan, on uplands.

Subclass IIIw.—Soils that have severe limitations because of excess water.

Capability unit IIIw–1.—Moderately well drained to somewhat poorly drained, well-stratified deposits of soil material that has light and medium texture.

Capability unit IIIw–2.—Poorly drained, clayey alluvial soils in slack-water areas of the Delta, subject to moderately severe crop damage from flooding.

Subclass IIIs.—Soils that have severe limitations of moisture capacity or tilth.

Capability unit IIIs–1.—Disturbed soil material that has heavy, clayey texture and poor physical properties.

Class IV.—Soils that have very severe limitations that restrict the choice of plants, require very careful management, or both.

Subclass IVe.—Soils subject to very severe erosion if they are cultivated and not protected.

Capability unit IVe–1.—Deep, well-drained, strongly sloping soils on uplands.

Capability unit IVe–2.—Moderately well drained, sloping, severely eroded soils that have a fragipan, on uplands.

Capability unit IVe–3.—Moderately well drained, strongly sloping soils that have a fragipan, on uplands.

Subclass IVw.—Soils that have very severe limitations for cultivation, because of excess water.

Capability unit IVw–1.—Somewhat poorly drained, fine-textured alluvial soil subject to severe crop damage from flooding.

Capability unit IVw–2.—Poorly drained alluvial soils subject to severe crop damage from flooding.

Capability unit IVw–3.—Poorly drained, nearly level soils that have a fragipan, on uplands.

Class V.—Soils not likely to erode that have other limitations, impractical to remove without major reclamation, that limit their use largely to pasture or range, woodland, or wildlife food and cover.

Subclass Vw.—Soils too wet for cultivation; drainage or protection not feasible.

Capability unit Vw–1.—Poorly drained, heavy, plastic clay soils in slack-water areas of the Delta that are frequently flooded.

Class VI.—Soils that have severe limitations that make them generally unsuitable for cultivation and that limit their use largely to pasture or range, woodland, or wildlife food and cover.

Subclass VIe.—Soils severely limited, chiefly by risk of erosion if protective cover is not maintained.

Capability unit VIe–1.—Deep, well-drained to somewhat excessively drained soils on uplands that have steep and very steep slopes.

Capability unit VIe-2.—Moderately well drained, strongly sloping, severely eroded soils that have a fragipan, on uplands.

Capability unit VIe-3.—Moderately well drained to well drained, steeply sloping soils on uplands.

Capability unit VIe-4.—Well-drained silty soils on uplands that have slopes of 2 to 17 percent and that have been reclaimed by grading and smoothing.

Capability unit VIe-5.—Well-drained, very severely eroded, silty soils on uplands; gullies occupy about 50 percent of the area.

Capability unit VIe-6.—Moderately well drained, very severely eroded soils that have a fragipan, on uplands; gullies occupy about 50 percent of the area.

Class VII.—Soils that have very severe limitations that make them unsuitable for cultivation without major reclamation and that restrict their use largely to grazing, woodland, or wildlife.

Subclass VIIe.—Soils very severely limited, chiefly by risk of erosion if protective cover is not maintained.

Capability unit VIIe-1.—Moderately well drained to well drained, severely eroded, steeply sloping and very steeply sloping soils on uplands.

Capability unit VIIe-2.—Moderately well drained to well drained, steeply to very steeply sloping, slightly to severely eroded soils.

Capability unit VIIe-3.—Medium-textured to coarse-textured soils so severely eroded that the areas are mostly an intricate pattern of gullies.

Class VIII.—Soils and landforms that, without major reclamation, have limitations that preclude their use for commercial production of plants and restrict their use to recreation, wildlife, water supply, or esthetic purposes. (None in Tate County.)

Management of soils by capability units

In the following pages each capability unit in the county is described, and the soils in it are listed. Use and management of the soils in each group are discussed. As stated in the explanation of capability grouping, a capability unit consists of soils that are suited to the same crops, require similar management, and produce about the same yields. Any practical grouping of soils, however, is tentative and subject to change as new methods are discovered or new information becomes available.

CAPABILITY UNIT I-1

This capability unit consists of well drained and moderately well drained soils in alluvium that are subject to a slight hazard of flooding. They are brown, friable silt loams that are free of gray mottles above a depth of 18 inches. These soils occur in narrow, U-shaped bottom lands. The grade of the bottom lands and of side slopes ranges from 1 to 3 percent. The soils are flooded occasionally, especially during heavy summer showers. The floods, however, do not last long and cause only minor damage to crops.

Plant roots readily penetrate the surface layer and subsoil. The infiltration rate and permeability are moderate, and the available water capacity is high. The soils of this unit are easily worked, but they crust and pack and a plowpan forms. They have moderate natural fertility, and a small organic-matter content. Crops respond well to applications of fertilizer. The Collins soils are acid, and crops on these soils respond well to lime. The Adler and Morganfield soils are slightly acid to mildly alkaline, and no lime is needed.

The soils are—

Adler silt loam, local alluvium.
Adler and Morganfield silt loams, local alluvium.
Collins silt loam, local alluvium.

These soils occupy about 4 percent of the county. Most of their acreage is used for row crops and pasture.

Under a high level of management, these soils produce high yields of cotton, corn, soybeans, grain sorghum, Coastal bermudagrass, common bermudagrass, johnsongrass, bahiagrass, wild winter peas, vetch, lespedeza, red clover, and white clover. Yields of corn and other summer annual crops vary greatly from year to year, depending on the amount and distribution of rainfall during the growing season.

These soils have few limitations that restrict their use. A suitable water-disposal system for the removal of surface water is needed. The most serious problem is caused by the flow of water from hillsides across the bottom lands. This problem can be reduced, and often eliminated, by diversion terraces. Row crops can be grown continuously if good management and the proper kinds and amounts of fertilizer are used. If a plowpan forms, it can be broken by chiseling when the soils are dry.

CAPABILITY UNIT I-2

Dundee loam, 0 to 2 percent slopes, is the only soil in this capability unit. The surface layer is very friable, dark grayish-brown loam. The subsoil is dark grayish-brown loam to clay loam mottled with gray in the lower part. Floods cause only minor damage to crops on this soil. The soil occurs along the old natural levees of the Coldwater River and is protected from flooding by the Arkabutla Reservoir.

Plant roots readily penetrate the surface layer and subsoil. The infiltration rate is moderate, and permeability is slow to moderate. The available water capacity is high. This soil has good tilth and can be worked within a wide range of moisture content. It is easily worked, but a plowpan forms readily. This soil contains a small amount of organic matter and has high natural fertility. Crops respond well to applications of nitrogen.

This soil occupies about 0.1 percent of the county. All the acreage is used for row crops, chiefly cotton.

Under a high level of management, this soil produces economic yields of cotton, corn, sorghum, soybeans, barley, oats, rye, wheat, common bermudagrass, Coastal bermudagrass, dallisgrass, tall fescue, johnsongrass, millet, rescuegrass, ryegrass, sudangrass, alfalfa, annual lespedeza, crimson clover, white clover, red clover, field peas, sweetclover, vetch, wild winter peas, truck crops, and pecans. Yields of corn and other summer annual crops vary from year to year, depending on the rainfall during the growing season.

This soil has few limitations that restrict its use. It needs, however, a water-disposal system, usually one consisting of W-ditches and graded rows. Row crops can be

grown continuously on this soil. The content of organic matter can be maintained by proper management of crop residue. If a plowpan forms, it can be broken by chiseling when the soil is dry. All row crops and pasture crops, except legumes, require additions of nitrogen.

CAPABILITY UNIT IIe–1

Memphis silt loam, 2 to 5 percent slopes, eroded, is the only soil in this capability unit. It has a brown, friable silt loam surface layer and a brown or dark-brown, friable silty clay loam subsoil.

This soil is well drained, and plant roots penetrate it readily. The root zone is deep. Water from rainfall or melting snow enters the surface layer slowly. Permeability is moderate. The available water capacity is high, and crops growing on this soil withstand the effects of short droughts. This soil is easy to cultivate but crusts and packs readily. It has moderate natural fertility and contains a small amount of organic matter. It is strongly acid to medium acid. Crops respond well to applications of fertilizer.

This capability unit makes up approximately 2 percent of the county. Most of the acreage is in row crops and pasture.

Under a high level of management, this soil produces good yields of all crops, pasture, and trees. Cotton, corn, soybeans, grain sorghum, small grain, Coastal and common bermudagrass, tall fescue, wild winter peas, annual and sericea lespedeza, crimson clover, vetch, sudangrass, bahiagrass, dallisgrass, johnsongrass, alfalfa, red clover, white clover, and crimson clover can be produced.

Yields of summer annual crops vary widely from year to year, depending on the length and severity of periods of unfavorable weather during the growing season.

Erosion is a moderate problem on this soil. It can be controlled, however, by using a cropping system and water-control practices that reduce and slow the rate of runoff. Unless a good system of water control is used, close-growing crops are needed about half the time. A suitable cropping sequence is 2 years of small grain and lespedeza followed by 2 years of row crops.

If erosion is adequately controlled, this soil can be used continuously for clean-tilled crops. Tillage on the contour, sod waterways, and terraces control runoff and soil loss effectively.

CAPABILITY UNIT IIe–2

Capability unit IIe–2 consists of moderately well drained, acid upland soils that have a mottled, compact fragipan about 2 feet from the surface. They have a brown, friable silt loam surface layer. Their subsoil is friable, dark yellowish-brown to dark-brown silt loam or silty clay loam.

Plant roots readily penetrate the soils above the fragipan but are greatly restricted in the pan. Water moves slowly through the fragipan; therefore the upper subsoil tends to become waterlogged during rainy periods, particularly in winter and early in spring. Because the root zone is largely restricted to the upper 2 feet, these soils are slightly droughty in dry summers. The soils are easy to cultivate, but they crust and pack. They contain a small amount of organic matter, have moderate natural fertility, and have moderate available water capacity. They are strongly acid. Crops respond well to applications of lime and fertilizer.

792-053—67——3

The soils are—

Loring-Grenada silt loams, 2 to 5 percent slopes.
Loring-Grenada silt loams, 2 to 5 percent slopes, eroded.

These soils make up about 6.1 percent of the county. Most of the acreage is used for pasture and row crops. The rest is in trees.

Under a high level of management, these soils produce good yields of cotton, corn, soybeans, grain sorghum, small grain, Coastal and common bermudagrass, dallisgrass, johnsongrass, bahiagrass, fescue, wild winter peas, vetch, annual and sericea lespedeza, crimson clover, white clover, and sudangrass. Yields of corn and other summer annual crops vary widely from year to year, depending on the rainfall during the growing season.

Erosion problems on these soils are moderate. Erosion can be controlled, however, by using cropping systems and water-control practices that reduce and slow runoff. Unless good water-control practices are used, close-growing crops are needed about half the time. A suitable cropping sequence is 2 years of small grain and lespedeza followed by 2 years of row crops.

If erosion is adequately controlled, clean-tilled crops can be grown continuously. Tillage on the contour, sod waterways, and terraces control runoff and soil loss effectively.

CAPABILITY UNIT IIw–1

Dundee silty clay loam, 0 to 2 percent slopes, is the only soil in this capability unit. It is a moderately well drained soil on natural levees of the Delta. It is subject to moderate crop damage from flooding. The surface layer is dark grayish-brown silty clay loam. The subsoil is brown silty clay loam underlain by loam.

This soil is somewhat difficult to work. Wetness may delay the planting of crops in spring. The soil gets hard and crusty when dry and is sticky when wet. The range of moisture content within which the soil can be cultivated is somewhat narrow. The soil contains a small amount of organic matter and has high natural fertility. The available water capacity is high. The soil is medium acid. Crops respond well to applications of nitrogen.

Dundee silty clay loam, 0 to 2 percent slopes, occupies less than 0.1 percent of the county. All the acreage is used for row crops.

Under a high level of management, this soil produces good yields of row crops and pasture. It is suited to cotton, grain sorghum, soybeans, barley, oats, rye, wheat, bahiagrass, bermudagrass, dallisgrass, johnsongrass, millet, rescuegrass, ryegrass, sudangrass, annual lespedeza, red clover, vetch, and wild winter peas. Corn, alfalfa, crimson clover, sweet clover, and field peas are poorly suited.

The removal of surface water is a problem on this soil. Graded row furrows, V- and W-ditches, and field laterals are useful in removing excess surface water. Row crops can be grown continuously if the soil is adequately drained.

CAPABILITY UNIT IIw–2

Loring-Grenada silt loams, 0 to 2 percent slopes, is the only mapping unit in this capability unit. They are moderately well drained, nearly level, medium-textured soils in the uplands. The soils have a brown, friable silt loam

surface layer and a friable, dark yellowish-brown to dark-brown silt loam or silty clay loam subsoil. A mottled, compact fragipan is at a depth of about 2 feet.

Plant roots readily penetrate the soils above the fragipan but are greatly restricted in the pan. Water moves slowly through the fragipan, and the subsoil tends to become waterlogged during rainy periods, particularly in winter and early in spring. Because the root zone is largely restricted to the upper 2 feet, these soils are slightly droughty in dry summers. The soils are easy to cultivate, but they crust and pack readily. The available water capacity is moderate. The soils contain a small amount of organic matter and are strongly acid. They have moderate natural fertility, but plants respond well to applications of lime and fertilizer.

These soils occupy approximately 0.1 percent of the county. Most of the acreage is in pasture and row crops.

Under a high level of management, these soils produce good yields of all the commonly grown crops and pasture plants. Cotton, corn, soybeans, grain sorghum, small grain, Coastal and common bermudagrass, dallisgrass, johnsongrass, bahiagrass, fescue, wild winter peas, vetch, annual and sericea lespedeza, crimson clover, white clover, and sudangrass are suited. Yields of corn and other summer annual crops vary from year to year, depending on the rainfall during the growing season.

Plowing and planting may be delayed in spring because the soil stays wet. Graded row furrows and W-ditches remove excess surface water effectively. Under good management, this soil may be used continuously for row crops.

CAPABILITY UNIT IIw-3

Capability unit IIw-3 consists of moderately well drained, nearly level, silty alluvial soils that have no mottles in the upper 18 inches. These soils are subject to moderate crop damage from flooding. They have a brown surface layer and are generally mottled gray and brown in the lower part of the subsoil.

Plant roots readily penetrate the surface layer and the upper part of the subsoil. The water table is within 1½ feet of the surface during the rainy period, particularly in winter and early in spring. These soils are easy to cultivate, but they crust and pack. A plowpan forms readily. The soils have moderate natural fertility and contain a small amount of organic matter. The available water capacity is high. Crops on these soils respond well to applications of fertilizer. The Collins soils are acid, and plants on them respond to lime. The Adler and Morganfield soils are slightly acid to alkaline and need no lime.

The soils are—

Collins silt loam.
Adler and Morganfield silt loams.

These soils make up about 12.6 percent of the county. Most of the acreage is in row crops and pasture.

Under a high level of management, these soils produce good yields of all crops and pasture plants. Cotton, corn, soybeans, grain sorghum, small grain, and all common grasses and legumes are suited. Yields of corn and other summer annual crops vary considerably from year to year, depending on the length and severity of periods of unfavorable weather during the growing season.

Under good management, this soil can be used continuously for row crops. The removal of surface water is a problem in places, but crop damage from flooding is moderate. The crop rows should be so arranged that the row furrows will carry excess water to a properly constructed outlet. V- and W-ditches and field laterals are needed in places. Diversion ditches are effective in intercepting runoff from hillsides and preventing it from flowing across these soils. If a plowpan forms, it can be broken by chiseling when the soil is dry.

CAPABILITY UNIT IIw-4

Capability unit IIw-4 consists of somewhat poorly drained, silty, nearly level alluvial soils that have mottled layers below a depth of about 6 inches. They are subject to moderate crop damage from flooding. The surface layer is brown to yellowish-brown silt loam. The subsoil in most places is brown and gray, mottled silt loam.

The water table is about ½ to 1 foot from the surface during rainy periods, particularly in winter and early in spring. The available water capacity is high. These soils are easy to cultivate, but they crust and pack readily. They contain a small amount of organic matter and have moderate natural fertility. Crops on these soils respond well to applications of fertilizer. The Falaya soil is acid, and plants on it respond to lime. The Wakeland soil is slightly acid to alkaline and needs no lime.

The soils are—

Falaya silt loam.
Wakeland silt loam.

These soils make up about 11.3 percent of the county. Most of the acreage is in row crops and pasture.

Under a high level of management, these soils produce good yields of most crops. They are suited to corn, cotton, soybeans, grain sorghum, small grain (except barley), Coastal and common bermudagrass, fescue, dallisgrass, johnsongrass, bahiagrass, wild winter peas, vetch, lespedeza, red clover, and white clover. Yields of corn and other summer annual crops vary considerably from year to year, depending on the length and severity of periods of unfavorable weather during the growing season.

Management should provide for adequate fertilizer, for the use of crop residue, and for a system to dispose of excess water. Plowing and planting may be delayed in spring because the soil stays wet. Row crops can be grown continuously, however, if an adequate water-disposal system is installed. Flood damage to crops is moderate.

The removal of surface water is a problem in places. In a suitable water-disposal system, furrows between rows carry excess water to a properly constructed outlet. V- and W-ditches are generally needed. Diversion terraces are effective in intercepting water from hillsides and preventing it from flowing across the soils. If a plowpan forms, it can be broken by chiseling when the soil is dry.

CAPABILITY UNIT IIw-5

This capability unit consists of somewhat poorly drained, acid upland soils that have a fragipan at a depth of about 18 inches. The soils have a brown, friable silt loam surface layer and a yellowish-brown silt loam subsoil.

Plant roots readily penetrate the soils above the fragipan but are greatly restricted in the pan. Water moves slowly through the fragipan, and as a result, the upper subsoil becomes waterlogged during rainy periods, particularly in

winter and early in spring. Because the root zone is largely restricted in the upper 18 inches, these soils are droughty in dry summers. They are easily worked, but they crust and pack. The soils contain a small amount of organic matter and have moderate natural fertility. The available water capacity is moderate. The soils are strongly acid. Crops respond well to applications of lime and fertilizer.

The soils are—

Calloway silt loam, 0 to 2 percent slopes.
Calloway silt loam, 2 to 5 percent slopes.
Calloway silt loam, 2 to 5 percent slopes, eroded.

These soils occupy about 1.6 percent of the county. Most of the acreage is used for pasture and row crops.

Under a high level of management, these soils produce fair to good yields of most crops and pasture plants. The soils are suited to cotton, soybeans, grain sorghum, small grain, Coastal and common bermudagrass, fescue, dallisgrass, bahiagrass, wild winter peas, vetch, annual lespedeza, and white clover. Yields of soybeans and other summer annual crops vary from year to year, depending on the rainfall during the growing season.

Drainage is the main problem on slopes of 0 to 2 percent. Erosion is a slight problem on slopes of 2 to 5 percent.

If the soils are properly drained through graded furrows between rows and vegetated waterways, are fertilized, and are otherwise well managed, clean-tilled crops can be grown continuously. Undrained areas are better suited to perennial plants.

CAPABILITY UNIT IIIe-1

Capability unit IIIe-1 consists of well-drained, gently sloping and sloping soils on uplands. The surface layer in most places is brown, friable silt loam. The subsoil is brown to dark-brown silty clay loam.

Plant roots penetrate the soil readily. The root zone is deep. Infiltration is slow and permeability is moderate. The available water capacity of these soils is high. The soils of this unit are easy to cultivate, but they crust and pack. They have moderate natural fertility and contain a small amount of organic matter. The soils are acid. Crops respond well to applications of lime and fertilizer.

The soils are—

Memphis silt loam, 2 to 5 percent slopes, severely eroded.
Memphis silt loam, 5 to 8 percent slopes, eroded.
Memphis silt loam, 5 to 8 percent slopes, severely eroded.

The soils of this unit make up about 4.3 percent of the county. Most of the soils are in pasture or row crops.

Under a high level of management, these soils produce moderate yields of pasture plants and crops. Cotton, corn, soybeans, grain sorghum, small grain, Coastal and common bermudagrass, dallisgrass, johnsongrass, bahiagrass, fescue, sudangrass, wild winter peas, vetch, alfalfa, annual and sericea lespedeza, red clover, white clover, and some hardwoods and pines are suited. Yields of corn and other summer annual crops vary considerably from year to year, depending on the rainfall during the growing season.

Erosion on these soils is a serious problem. It can be controlled by using a cropping sequence and water-control practices that reduce and slow runoff. Good water-control practices are needed unless close-growing crops are used most of the time. A suitable cropping sequence is 4 years of sod followed by 2 years of row crops.

If water-control practices are used, close-growing plants are needed only half the time. Then, a suitable cropping sequence would be 2 years of close-growing crops followed by 2 years of row crops.

CAPABILITY UNIT IIIe-2

Loring-Grenada silt loams, 2 to 5 percent slopes, severely eroded, is the only mapping unit in capability unit IIIe-2. The surface layer is brown, friable silt loam, and the subsoil is yellowish-brown to dark-brown silt loam or silty clay loam. The soils have a mottled, compact fragipan at a depth of about 20 to 28 inches.

Plant roots readily penetrate the soil above the fragipan but are greatly restricted in the pan. Water moves slowly through the fragipan. The upper part of the subsoil tends to become waterlogged during rainy periods, particularly in winter and early in spring. Because the root zone is limited mainly to the area above the pan, these soils are droughty in dry summers. They are easily kept in good tilth. They have moderate natural fertility and contain a small amount of organic matter. The available water capacity is moderate. The soils are strongly acid. Crops respond well to applications of lime and fertilizer.

Loring-Grenada silt loams, 2 to 5 percent slopes, severely eroded, makes up about 1.7 percent of the county. The acreage is used chiefly for pasture and trees, but some is in row crops.

Under a high level of management, the soils produce moderate yields of cotton, corn, soybeans, grain sorghum, small grain, Coastal and common bermudagrass, dallisgrass, johnsongrass, bahiagrass, fescue, wild winter peas, annual and sericea lespedeza, crimson clover, vetch, white clover, and sudangrass. Pine trees grow well. Yields of summer annual crops vary from year to year, depending on the rainfall during the growing season.

Erosion is a serious hazard on these soils. It can be controlled by using a cropping sequence that reduces and slows runoff. Good water-control practices are needed unless close-growing crops are used most of the time. A suitable cropping sequence is 4 years of sod followed by 2 years of row crops.

If water-control practices are used, close-growing crops are needed only half the time. Then, a suitable cropping sequence would be 2 years of small grain and lespedeza followed by 2 years of row crops. Tillage on the contour, sod waterways, and terraces control runoff and soil loss effectively.

CAPABILITY UNIT IIIe-3

Capability unit IIIe-3 consists of moderately well drained soils that have a mottled, compact fragipan at a depth of about 2 feet. The surface layer is brown or grayish-brown, friable silt loam, and the subsoil is yellowish-brown silt loam.

Plant roots readily penetrate the soil above the fragipan but are greatly restricted in the pan. Water moves slowly through the pan. The upper part of the subsoil tends to become waterlogged during rainy periods, particularly in winter and early in spring. Because the root zone is largely restricted to the upper 2 feet, these soils are droughty in dry summers. The soils are easily kept in good tilth. They contain a small amount of organic matter and have moderate natural fertility. The available

moisture capacity is moderate. The soils are strongly acid. Crops respond well to applications of lime and fertilizer.

The soils are—

Grenada silt loam, 5 to 8 percent slopes.
Grenada silt loam, 5 to 8 percent slopes, eroded.

These soils occupy about 1.4 percent of the county. Most of the acreage is used for pasture plants and trees.

Under a high level of management, these soils produce moderately high yields of the commonly grown row and pasture crops. These crops include cotton, corn, soybeans, grain sorghum, small grain, Coastal and common bermudagrass, dallisgrass, johnsongrass, bahiagrass, fescue, wild winter peas, annual and sericea lespedeza, crimson clover, vetch, white clover, and sudangrass. Some hardwoods and pine trees grow well. Yields of corn and other summer annual crops vary from year to year, depending on the rainfall during the growing season.

Erosion on these soils is a moderate problem. It can be controlled by using a cropping sequence and water-control practices that reduce and slow down runoff. Unless good water-control practices are used, these soils should be kept in close-growing crops most of the time. A suitable cropping sequence is 4 years of sod followed by 2 years of row crops.

If water-control practices are used, close-growing crops are needed only half the time. Then, a suitable cropping sequence would be 2 years of oats and lespedeza followed by 2 years of row crops. Tillage on the contour, sod waterways, and terraces control runoff and soil loss effectively.

CAPABILITY UNIT IIIw-1

Alluvial land is the only mapping unit in capability unit IIIw-1. It consists of moderately well drained to somewhat poorly drained alluvial deposits. These deposits consist of stratified layers of alternate silty, sandy, and loamy materials. The surface is irregular in many places.

In this unit the depth of the root zone varies from place to place. Because of the large content of sand and stratification of the surface layer and the upper part of the subsoil, this land type is slightly droughty in dry summers. The natural fertility is low, and the amount of organic matter is small. The available water capacity is low. This land type is strongly acid. Crops respond well to applications of lime and fertilizer.

Alluvial land occupies about 1.3 percent of the county. Most areas are in row crops or pasture.

Under a high level of management, this land type produces good yields of commonly grown row crops and pasture; trees also grow well. Alluvial land is suited to cotton, corn, soybeans, small grain, bermudagrass, bahiagrass, annual lespedeza, some hardwoods, and pines.

Yields of summer annual crops vary considerably from one year to another, depending on the length and severity of periods of drought during the growing season. Damage from floods to crops grown on this land type generally is moderately severe.

The removal of surface water from some areas is a problem. Water can be removed by a suitable water-disposal system. Such a system includes row furrows that carry excess water to a properly constructed outlet. V- and W-ditches may also be needed. Diversion terraces are helpful in keeping hillside water off the land. If a suitable water-disposal system is used, this land type can be used continuously for row crops. Unless an adequate water-disposal system is used, it is better suited to perennial plants.

CAPABILITY UNIT IIIw-2

Capability unit IIIw-2 consists of poorly drained, clayey alluvial soils in the slack-water areas of the Delta. They are subject to moderately severe crop damage from flooding. The soils have a grayish-brown or gray clay or silty clay loam surface layer over a gray, heavy, plastic clay subsoil.

These soils are difficult to manage. Because they swell and seal over when wet and crack severely when dry, crop production is uncertain. Runoff is very slow, and excess water ponds in the more nearly level areas after heavy rains. Water moves into and through the soils very slowly. The available water capacity is high. In many places the water table is near the surface during long, wet periods. The amount of organic matter is fairly large when the soils are first cleared, but it decreases rapidly when they are cultivated. The natural fertility is high. The soils are acid. Crops respond well to applications of lime and nitrogen fertilizer.

The soils are—

Alligator clay.
Alligator silty clay loam.

These soils make up about 0.8 percent of the county. The acreage is used mostly for row crops and rice, but some is in pasture.

Under a high level of management, these soils produce moderate yields of soybeans, small grain (except barley), bermudagrass, dallisgrass, fescue, annual lespedeza, ladino clover, red clover, wild winter peas, vetch, and white clover.

The soils of this unit are poorly drained. Seedbeds should be prepared in the fall to permit weathering and settling of the soils. Cultivation is restricted within a narrow range of moisture content. The content of organic matter should be maintained to improve tilth and to increase infiltration. Row and farm road arrangements, V- and W-ditches, field laterals, and adequate outlets are needed for the removal of excess water.

Unless an adequate water-disposal system is used, these soils are better suited to perennial plants. With a good disposal system, row crops can be grown continuously.

CAPABILITY UNIT IIIs-1

Made land is the only mapping unit in capability unit IIIs-1. It consists of poorly drained heavy clay, ranging from yellowish brown to black in color. It was made from the soil dug from the Coldwater River when the channel was deepened. Slopes range from about 8 to 12 percent.

Made land has a very slow rate of infiltration and a high moisture-holding capacity. It has high natural fertility and contains a large amount of organic matter. It shrinks and cracks when it dries, and some plant roots are harmed. The fine texture and poor drainage prevent plants from using fertilizer effectively.

Made land makes up about 0.1 percent of the county. The acreage is used mostly for soybeans, but pasture, hay, some row crops, and some hardwoods are suitable.

This land type is difficult to manage. It can be culti-

vated only within a narrow range of moisture content. Seedbeds should be prepared in fall to permit the weathering and settling of the soil material. Row crops can be grown continuously if crop residue is properly used and the crops are grown on the contour. Close-growing crops and crop residue help maintain the content of organic matter and thus improve tilth and increase infiltration. Crop residue should be shredded and left on the surface.

CAPABILITY UNIT IVe-1

Capability unit IVe-1 consists of well-drained silty soils that have slopes of 8 to 12 percent. They have a dark grayish-brown to dark-brown, friable silt loam surface layer over a brown to dark-brown silty clay loam subsoil.

Plant roots readily penetrate these soils. The infiltration rate is slow, but water moves through the soil at a moderate rate. Runoff is rapid, and rainfall during the growing season does not wet these soils throughout the profile. For this reason, the soils are slightly droughty, even though their moisture-holding capacity is high. Natural fertility is moderate, and the amount of organic matter is small. These soils are medium acid to strongly acid. Crops respond well to applications of lime and fertilizer.

The soils are—

Memphis silt loam, 8 to 12 percent slopes, eroded.
Memphis silt loam, 8 to 12 percent slopes, severely eroded.

These soils make up about 1.6 percent of the county. Most of the acreage is in pasture or trees.

Under a high level of management, these soils produce moderate yields of cotton, corn, soybeans, grain sorghum, small grain, bermudagrass, dallisgrass, johnsongrass, bahiagrass, fescue, sudangrass, wild winter peas, vetch, alfalfa, annual and sericea lespedeza, red clover, white clover, and crimson clover. Adapted hardwoods and pines grow well. Yields of corn and other summer annual crops vary greatly from year to year, depending on the length and severity of periods of unfavorable weather during the growing season.

Erosion is a severe problem on these soils. It can be controlled, however, by using a cropping system and water-control practices that reduce and slow runoff. Unless good water-control practices are used, these soils should be kept in perennial plants.

If water-control practices are used, row crops can be grown about 2 years in 8; for example, 6 years of sod crops followed by 2 years of row crops. Tillage on the contour, sod waterways, and terraces control soil loss effectively.

CAPABILITY UNIT IVe-2

Grenada silt loam, 5 to 8 percent slopes, severely eroded, is the only soil in capability unit IVe-2. It has a dark yellowish-brown silt loam surface layer and a yellowish-brown silt loam subsoil that has a mottled, compact fragipan at a depth of about 20 inches.

Plant roots readily penetrate the soil above the fragipan, but they are greatly restricted in the pan. Water moves slowly through the fragipan; therefore, the upper subsoil tends to become waterlogged during rainy periods, particularly in winter and early in spring. Runoff is moderate to rapid. Because the root zone is largely restricted to the area above the fragipan and runoff is moderate to rapid, this soil is droughty in dry summers. It is easily worked, but crusts and packs if left bare. The soil has moderate natural fertility and contains a small amount of organic matter. The available water capacity is moderate. This soil is strongly acid. Crops respond well to applications of lime and fertilizer.

Grenada silt loam, 5 to 8 percent slopes, severely eroded, makes up about 6.5 percent of the county. Most of the acreage is in pasture or row crops.

Under a high level of management, this soil produces moderate yields of the commonly grown pasture plants and row crops. It is suited to cotton, corn, soybeans, grain sorghum, small grain, bermudagrass, dallisgrass, johnsongrass, bahiagrass, fescue, wild winter peas, annual and sericea lespedeza, crimson clover, white clover, and sudangrass, and to pine trees. Yields of corn and other summer annual crops vary greatly from year to year, depending on the length and severity of periods of unfavorable weather during the growing season.

Erosion is a severe problem on this soil. It can be controlled by using a cropping sequence and erosion control practices that reduce and slow runoff. Unless good control practices are used, the soil should be in perennial plants continuously.

If water-control practices are used, row crops can be grown about 2 years out of 8. A suitable cropping sequence would be 6 years of sod followed by 2 years of row crops. Tillage on the contour, sod waterways, and terraces control runoff and soil loss effectively.

CAPABILITY UNIT IVe-3

Capability unit IVe-3 consists of moderately well drained, strongly sloping upland soils that have a fragipan. They have a brown, friable silt loam surface layer and a yellowish-brown silt loam subsoil. They have a mottled, compact fragipan at a depth of about 2 feet.

Plant roots readily penetrate the soils above the fragipan, but are greatly restricted in the pan. Water moves slowly through the fragipan. Runoff is rapid, and rainfall during the growing season generally does not fill the soil to its moisture-holding capacity. For this reason, and also because plant roots are largely restricted to the area above the fragipan, the soils are droughty in summer. Their available water capacity is moderate. Natural fertility is moderate, and the amount of organic matter is small. These soils are strongly acid. Crops on them respond well to applications of lime and fertilizer.

The soils are—

Grenada silt loam, 8 to 12 percent slopes.
Grenada silt loam, 8 to 12 percent slopes, eroded.

These soils make up about 0.7 percent of the county. Most of the acreage is in woodland. The rest is in pasture.

These soils can be used for row crops, but because they are readily eroded, they are best suited to pasture or to trees. Cotton, corn, soybeans, and grain sorghum grow on these soils, but yields are often low. Small grain, bermudagrass, dallisgrass, johnsongrass, bahiagrass, fescue, wild winter peas, annual and sericea lespedeza, crimson clover, white clover, sudangrass, and pine trees grow fairly well. Yields of corn and other summer annual crops vary greatly from year to year, depending on the length and severity of periods of unfavorable weather during the growing season.

Erosion is a problem on these soils. It can be controlled

by using a suitable cropping sequence and practices that reduce and slow runoff. The soils should be kept in perennial plants continuously if water-control practices are not used. If these practices are used, the soils can be clean-tilled about 2 years in 8, and kept in sod the remaining 6 years. A good water-disposal system on these soils includes terraces, grassed waterways, and contour row arrangement.

CAPABILITY UNIT IVw-1

Arkabutla silty clay loam is the only soil in capability unit IVw-1. It is a somewhat poorly drained, nearly level alluvial soil that is subject to severe crop damage from flooding. The surface layer is yellowish-brown silty clay loam, and the subsoil is brown and gray mottled silty clay loam.

Arkabutla silty clay loam makes up about 0.9 percent of the county. It is used chiefly for hardwoods.

This soil is subject to severe flooding. Its use for row crops is not feasible unless the flood hazard is reduced. Its best use is for hardwoods and summer pasture.

A complete water-disposal system, including V- and W-ditches and field laterals and other control measures, is needed to prevent flood damage. If the soil is protected from flooding, as are some areas downstream from the Arkabutla Reservoir, the cropping sequence and kinds of plants suggested for the soils in capability unit IIw-4 can be used.

CAPABILITY UNIT IVw-2

Waverly silt loam is the only soil in capability unit IVw-2. It is a poorly drained, nearly level alluvial soil that is subject to severe crop damage from flooding. It has a gray and brown mottled surface layer and a gray silt loam subsoil.

The water table is near the surface and keeps the soil saturated much of the time. The available water capacity is high. The soil contains a small amount of organic matter and has moderate natural fertility. It is strongly acid. Crops respond well to applications of lime and fertilizer.

Waverly silt loam makes up about 0.4 percent of the county. Most of the acreage is in woodland or pasture.

Because it is subject to flooding, this soil is best suited to some hardwoods and to summer pasture. If it is protected from floods, the soil is suited to bermudagrass, fescue, dallisgrass, bahiagrass, annual lespedeza, and some hardwoods. Dikes and levees are needed to help protect the soil from flooding.

CAPABILITY UNIT IVw-3

Henry silt loam is the only soil in capability unit IVw-3. It is a poorly drained, nearly level upland soil. It has a compact fragipan at a depth of about 1 foot. The entire profile is generally gray silt loam.

Plant roots readily penetrate the soil above the fragipan, but they are greatly restricted in the pan. Water moves slowly through the fragipan, and the soil tends to become waterlogged during rainy periods, particularly in winter and early in spring. Because the root zone is restricted largely to the upper foot, this soil is droughty in dry weather. It is easily worked but crusts and packs if left bare. It contains a small amount of organic matter and has low natural fertility. The available water capacity is low. The soil is strongly acid. Crops respond well to added lime and fertilizer.

Henry silt loam makes up about 0.3 percent of the county. Most of the acreage is used for pasture.

Under a high level of management, this soil produces fair yields of Coastal and common bermudagrass, fescue, bahiagrass, white clover, annual lespedeza, a few special truck crops, soybeans, grain sorghum, and dallisgrass. Some hardwoods and pines grow fairly well. Yields of summer crops vary from year to year, depending on the rainfall during the growing season. Crop failure is common in wet or very dry summers.

Water disposal is a problem on this soil. Surface water can be removed with a good water-disposal system. A suitable system includes furrows between rows to carry excess water to a properly constructed outlet. Surface ditches may also be needed. Diversion terraces are effective for intercepting water from nearby hillsides.

If a good water-disposal system is used, soybeans and other clean-tilled crops can be grown continuously. Unless such a system is used, sod crops should be grown continuously.

CAPABILITY UNIT Vw-1

This capability unit consists of poorly drained soils in the slack-water areas of the Delta. They are frequently flooded. These soils have a thin, gray to brown, heavy, plastic clay surface layer. The subsoil is gray, heavy, plastic clay.

The soils generally have poor tilth and are difficult to manage. Excess surface water often delays the planting and cultivation of row crops. When dry, the soils shrink and crack and the roots of some plants are injured. Water moves very slowly through these soils. In wet seasons, the water table is at the surface. The available water capacity is high. These soils have more organic matter than surrounding soils, and their natural fertility is high. They are strongly acid. The low position, poor drainage, and fine texture of these soils prevent plants from using fertilizer effectively.

The soils are—

Alligator-Dowling association.
Dowling clay.

These soils occupy approximately 1.5 percent of the county. They are used mostly for woods, but some areas of Dowling clay are used for rice.

Pasture, hay, and some hardwoods grow well on these soils. Suitable plants are rice, soybeans, and bermudagrass. Plants poorly suited are cotton, corn, grain sorghum, small grain, fescue, dallisgrass, johnsongrass, ladino clover, and white clover.

The removal of surface water is a serious problem. Runoff from higher soils collects and ponds on these soils because of inadequate outlets. Use of V- and W-ditches and outlets into primary and secondary ditches are needed. Perennial plants should be kept on these soils most of the time. An example would be permanent hay and sod, or rice for 2 years, followed by sod.

CAPABILITY UNIT VIe-1

This capability unit consists of very strongly sloping to steep, well-drained to somewhat excessively drained soils in the uplands. They have a dark grayish-brown to dark-brown, friable silt loam surface layer and a dark-brown to yellowish-brown silty clay loam or silt loam subsoil.

Plant roots readily penetrate these soils, and their root

zone is deep. The available water holding capacity is moderate to high. The organic-matter content is small, and natural fertility is moderate. Crops on these soils respond well to applications of fertilizer. The Memphis soils are acid, and crops on these soils respond to lime. The Natchez soils are alkaline and need no lime.

The soils are—

Memphis silt loam, 12 to 17 percent slopes, eroded.
Memphis silt loam, 12 to 17 percent slopes, severely eroded.
Memphis silt loam, 17 to 45 percent slopes.
Natchez-Memphis silt loams, 12 to 17 percent slopes.
Natchez-Memphis silt loams, 17 to 50 percent slopes.

These soils make up about 5.4 percent of the county. Most of their area is in pasture or trees.

The soils of this capability unit are suited to bermudagrass, bahiagrass, annual and sericea lespedeza, crimson clover, and adapted hardwoods and pines. Because of the slope and the erosion hazard, the soils are not suited to row crops.

These soils should be kept under perennial vegetation to reduce runoff, increase infiltration, and control erosion. A complete fertilizer is needed for growing pasture crops. Pastures on these soils should not be overgrazed, and woodlands should be protected from fire and harmful grazing.

CAPABILITY UNIT VIe-2

This capability unit consists of moderately well drained, severely eroded, strongly sloping soils that have a fragipan. They have a dark yellowish-brown silt loam surface layer and a yellowish-brown to dark-brown silt loam subsoil. A mottled, compact, brittle fragipan is at a depth of about 19 inches.

Plant roots readily penetrate the surface layer and upper subsoil but are greatly restricted in the fragipan. Water moves slowly through the fragipan. Because the root zone is largely confined to the upper 19 inches, these soils are slightly droughty in dry summers. They are easy to cultivate, but they crust and pack readily. They have moderate natural fertility and contain a small amount of organic matter. The available water capacity is moderate. The soils are strongly acid. Crops respond well to applications of lime and fertilizer.

The soils are—

Grenada silt loam, 8 to 12 percent slopes, severely eroded.
Providence silt loam, 8 to 12 percent slopes, severely eroded.

These soils occupy about 3.7 percent of the county. Most of the acreage is in pasture. The rest is in row crops and trees.

The soils in this unit are suited to bermudagrass, bahiagrass, wild winter peas, annual and sericea lespedeza, crimson clover, and some hardwoods and pines. Because of the high erosion hazard, these soils need to be kept under perennial vegetation, such as sod or trees. Erosion can be controlled by protecting the areas from fire and by fertilizing and liming pastures and protecting them from overgrazing.

CAPABILITY UNIT VIe-3

Providence-Ruston complex, 12 to 17 percent slopes, is the only mapping unit in capability unit VIe-3. The Providence soil generally occurs on ridgetops and on the upper part of slopes. It has a dark grayish-brown silt loam surface layer and a brown to dark-brown silty clay loam subsoil. It has a mottled, compact fragipan at a depth of about 25 inches that is underlain by sandy Coastal Plain material at depths of less than 4 feet. The Ruston soil occurs farther down the side slopes. It has a dark grayish-brown fine sandy loam surface layer and a yellowish-red sandy clay loam subsoil.

Plant roots readily penetrate the surface layer and upper subsoil of these soils. In the Providence soil, the roots are restricted in the fragipan. Water moves slowly through the fragipan. The soils of the Providence-Ruston complex have moderate available water holding capacity. They contain a small amount of organic matter and have low to moderate natural fertility. The soils are strongly acid. Crops respond well to applications of lime and fertilizer.

This complex of soils makes up about 1.3 percent of the county. Most of the acreage is in trees and pasture.

These soils are suited to bermudagrass, bahiagrass, sericea and annual lespedeza, crimson clover, pines, and some hardwoods.

Because of the slope and high erosion hazard, these soils are not suited to row crops. They should be kept under permanent vegetation to increase infiltration, decrease runoff, and provide protection from erosion. Pasture should be protected from overgrazing, and woodland should be protected from fire.

CAPABILITY UNIT VIe-4

Smoothed silty land is the only mapping unit in capability unit VIe-4. This land type has been reclaimed by grading and smoothing severely eroded or gullied land. It is well drained. The surface layer is brown to dark-brown silt loam or silty clay loam, and the subsoil is a brown to dark-brown silty clay loam.

Plant roots readily penetrate the surface layer and subsoil. The available water capacity is moderate, but rapid runoff in most areas makes the land somewhat droughty. This land type contains a small amount of organic matter and has moderate natural fertility. Most of it is acid. Crops respond well to applications of lime and fertilizer.

Smoothed silty land now makes up about 0.7 percent of the county, and more areas are continually being reclaimed. All of the acreage is used for pasture.

This land must be very carefully managed; otherwise, it will revert to gullied land. It is highly susceptible to erosion. Under a high level of management, bermudagrass, bahiagrass, wild winter peas, annual and sericea lespedeza, crimson clover, and trees are suited. A good sod must be established on areas of Smoothed silty land as soon as possible after reclaiming. It is generally advisable to use a mulch for protection against erosion while the sod is being established. A good sod should be maintained at all times.

CAPABILITY UNIT VIe-5

Memphis-Gullied land complex is the only mapping unit in capability unit VIe-5. The surface layer is well-drained silt loam or silty clay loam. The subsoil is brown to dark-brown silty clay loam. Gullies uncrossable by farm machinery dissect this complex at frequent intervals and make up about 25 to 50 percent of the total area. The rest of the complex consists of narrow fingers of the original soil between the gullies.

Plant roots readily penetrate the surface layer and sub-

soil. The soil between the gullies has a deep root zone. It has a moderate available water capacity. Runoff is rapid. It contains a small amount of organic matter and has moderate natural fertility. Most areas of this complex are acid. Crops respond well to applications of lime and fertilizer.

Memphis-Gullied land complex makes up about 4.6 percent of the county. Most of the acreage is in pasture or trees.

Under careful management, this complex is suited to bermudagrass, bahiagrass, wild winter peas, annual and sericea lespedeza, crimson clover, and pines. The narrow fingers of original soil between the gullies should be kept under perennial vegetation, such as sod or trees. Erosion can be controlled by protecting the areas from fire and by fertilizing and liming pastures and protecting them from harmful grazing. Many areas mapped as this complex have been smoothed and shaped to permit more intensive use and higher production.

CAPABILITY UNIT VIe-6

Grenada-Gullied land complex is the only mapping unit in capability unit VIe-6. The soils and gullied land in this unit are moderately well drained and have a fragipan at a depth of 10 to 20 inches. The surface layer and subsoil are yellowish-brown silt loam. Gullies, uncrossable by farm machinery, dissect this complex at frequent intervals and make up about 25 to 50 percent of the total area. The rest of the complex consists of narrow fingers of the original soil between the gullies.

Plant roots readily penetrate the surface layer and upper subsoil, but they are greatly restricted in the fragipan. Because the depth to the fragipan is shallow, the available water capacity is low to moderate. Runoff is rapid. The soil between gullies contains a small amount of organic matter and has moderate to low natural fertility. It is strongly acid. Crops respond well to applications of fertilizer.

Grenada-Gullied land complex makes up about 8.5 percent of the county. Most of the acreage is in pines or pasture.

Under careful management, this complex is suited to bermudagrass, bahiagrass, annual and sericea lespedeza, crimson clover, and pines. The narrow fingers of the original soil between the gullies should be kept under perennial vegetation, such as sod or trees. Further erosion can be controlled by protecting the areas from fire and by fertilizing and liming pastures and protecting them from overgrazing.

CAPABILITY UNIT VIIe-1

Memphis silt loam, 17 to 45 percent slopes, severely eroded, is the only soil in capability unit VIIe-1. It is well drained and has a brown to dark-brown silt loam surface layer and brown to dark-brown silty clay loam subsoil.

Plant roots readily penetrate this soil, and the root zone is deep. The available water capacity is moderate to high. This soil contains a small amount of organic matter and has moderate natural fertility. The soil is strongly acid to medium acid. Crops respond well to applications of fertilizer.

Memphis silt loam, 17 to 45 percent slopes, severely eroded, makes up about 0.5 percent of the county. Most of the acreage is in pasture, but it is rapidly reverting to woodland.

This soil is suited to bermudagrass, bahiagrass, annual and sericea lespedeza, crimson clover, some hardwoods, and pines. Because of the steep slope and high erosion hazard, the soil is not suited to clean-tilled crops.

Erosion is a severe problem on this soil. A permanent plant cover is required at all times to increase infiltration, reduce runoff, and prevent erosion. A complete fertilizer and lime are needed to produce pasture. Pasture, however, should not be overgrazed, and woodlands should be protected from fire and harmful grazing.

CAPABILITY UNIT VIIe-2

This capability unit consists of moderately well drained and well drained soils that are mapped as complexes. Slopes range from 12 to 50 percent. The Providence soils generally are on the ridgetops and the upper part of slopes. They have a dark grayish-brown to yellowish-brown silt loam surface layer and a brown to dark-brown silty clay loam subsoil. A mottled, compact fragipan is at a depth of about 25 inches. The pan is underlain at depths of less than 4 feet by sandy Coastal Plain materials. The Ruston soils are on the side slopes. They have a dark grayish-brown fine sandy loam surface layer and a yellowish-red sandy clay loam subsoil.

Plant roots readily penetrate the surface layer and upper subsoil of these soils. The roots are restricted, however, in the fragipan of the Providence soils. Water moves slowly through the pan. The available water capacity of these soils is moderate. The organic-matter content is small, and natural fertility is low to moderate. The soils are strongly acid.

The soils are—

Providence-Ruston complex, 12 to 17 percent slopes, severely eroded.
Ruston Providence complex, 17 to 50 percent slopes.

The soils of this unit make up about 3.0 percent of the county. Most of the acreage is wooded. These soils are subject to very severe erosion, which can be controlled, however, by maintaining a good stand of pines or suited hardwoods. The stands should be protected from fire and harmful grazing.

CAPABILITY UNIT VIIe-3

Capability unit VIIe-3 consists of severely eroded areas that are mostly an intricate pattern of gullies. The original soil has been washed away, except for small remnants between the gullies. Except in a few areas that are in the extreme western part of the hilly section of the county, the soil materials are acid. The texture ranges from sand to silty clay loam. Runoff is rapid, and the available water capacity is usually low.

The land types are—

Gullied land, sandy.
Gullied land, silty.

These land types account for approximately 12.9 percent of the county. Most of the acreage has been planted to pines.

These land types are subject to very severe erosion. They are suited to pines. A well-managed cover of trees is needed to stabilize the gullies and to reduce erosion. Trees

will also reduce the transfer of sediment to lower lying soils. The areas need protection from fire and from harmful grazing.

Estimated Yields

The soils of Tate County vary widely in productivity. Some soils consistently produce high yields of cultivated crops; others are better suited to less intensive use.

Estimates of the average yields of principal crops and pasture grown under two levels of management are shown in table 2. These are average yields for a long period of time. In any crop year, the yield of any crop may be more or less than that shown.

The estimates are based on (1) yields obtained in long-term experiments; (2) yields harvested on farms that cooperated in soil management studies; and (3) data provided by agronomists who have had much experience with the crops of Tate County.

In columns A are estimates of yields obtained under common management. In columns B are estimates obtained under improved practices. The yields under improved practices, however, are not presumed to be the maximum yields obtainable.

The following practices of improved management were assumed in estimating the yields in columns B:

1. Fertilizer applied according to the needs indicated by chemical tests and by past cropping and fertilizer practices.
2. Use of crop varieties that produce high yields and are suited to the soil.
3. Preparation of adequate seedbeds.
4. Planting or seeding by suitable methods, at suitable rates, and at the right time.
5. Inoculation of legumes.
6. Shallow cultivation of row crops.
7. Control of weeds, insects, and diseases.
8. Use of soil-conserving cropping sequences, as suggested in the section on capability units.
9. Water management, where needed, by sodding waterways, cultivating on the contour, terracing, or stripcropping.
10. Management of crop residue.

The yield estimates in table 2 are also based on fertilization that is not uniform for all the soils except those in alluvium on the Delta. Phosphate and potash are not required for the crops commonly grown on the soils of the Delta. Yields are based on fertilization of the different crops as follows:

Cotton.—For yields in columns A, apply 30 to 60 pounds of nitrogen per acre and 30 to 40 pounds each of phosphate and potash. For yields in columns B, apply 66 to 90 pounds of nitrogen per acre and 48 to 60 pounds each of phosphate and potash.

Corn.—For yields in columns A, apply 45 to 65 pounds of nitrogen and 20 to 35 pounds each of phosphate and potash per acre. Seed at a rate to get 8,000 to 10,000 plants per acre. For yields in columns B, apply 90 to 120 pounds of nitrogen and 40 to 60 pounds each of phosphate and potash per acre. Seed at a rate to get 10,000 to 12,000 plants per acre.

Oats.—For yields in columns A, apply 45 to 60 pounds of nitrogen and 20 to 35 pounds each of phosphate and potash per acre. For yields in columns B, apply 90 to 120 pounds of nitrogen and 45 to 60 pounds each of phospate and potash per acre.

Soybeans.—For yields in columns A, apply at planting time 40 to 50 pounds of phosphate and 20 to 25 pounds of potash per acre. Inoculate seed at planting time. For yields in columns B, apply at planting time 60 pounds of phosphate and 30 pounds of potash per acre. Inoculate seed at planting time.

Common bermudagrass and legume.—For yields in columns A, apply 30 pounds of nitrogen and 20 pounds each of phosphate and potash per acre per year. Apply enough lime to raise the pH to 5.4. For yields in column B, apply 100 pounds of nitrogen and 60 pounds each of phosphate and potash per acre per year. Apply enough lime to raise the pH to 6.0.

Bahiagrass and legume.—For yields in columns A, apply 30 pounds of nitrogen and 20 pounds each of phosphate and potash per acre per year. Apply enough lime to raise the pH to 5.0. For yields in columns B, apply 100 pounds of nitrogen and 60 pounds each of phosphate and potash per acre per year. Apply enough lime to raise the pH to 6.0.

Fescue and legume.—For yields in columns A, apply 60 pounds of nitrogen, 40 pounds of phosphate, and 20 pounds of potash per acre per year. Apply enough lime to raise the pH to 5.7. For yields in columns B, apply 120 pounds of nitrogen, 80 pounds of phosphate, and 60 pounds of potash per acre per year. Apply enough lime to raise the pH to 6.0.

Sericea lespedeza.—For yields in columns A, apply 30 pounds of phosphate and 20 pounds of potash per acre per year. Apply enough lime to raise the pH to 5.4. For yields in columns B, apply 90 pounds of phosphate and 60 pounds of potash per acre per year. Apply enough lime to raise the pH to 6.0.

Dallisgrass and legume.—For yields in columns A, apply 30 pounds of nitrogen and 20 pounds each of phosphate and potash per acre per year. Apply enough lime to raise the pH to 5.5. For yields in columns B, apply 100 pounds of nitrogen and 60 pounds each of phosphate and potash per acre per year. Apply enough lime to raise the pH to 6.5.

Use of Soils for Woodland [3]

In this section the principal kinds of trees in the county and where they grow are briefly discussed. The soils are placed in woodland suitability groups, and the factors that determined the grouping are explained. Each woodland suitability group is then discussed.

Woodland in the county

Early settlers in Tate County found a vast, virgin, hardwood forest; fertile soils; clear, deep streams; and abundant wildlife. No recorded evidence can be found that pines then grew in the area that is now Tate County. Three small groves of pine trees have been found on old plantation homesites and were apparently planted. All the upland soils in the county once supported good hard-

[3] ROBERT L. GRIGSBY, woodland conservationist, Soil Conservation Service, assisted in writing this section. Hardwood data were compiled by W. M. BROADFOOT, soil scientist, U.S. Forest Service, Southern Forest Experiment Station.

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TABLE 2.—*Estimated average acre*

[Yields in columns A are obtained under common management practices; yields in columns B are to be expected under improved management.

Soil	Cotton		Corn		Soybeans		Oats		Common bermudagrass and legume			
									Pasture		Hay	
	A	B	A	B	A	B	A	B	A	B	A	B
	Lb.	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Animal-unit-months* [1]	*Animal-unit-months* [1]	*Tons*	*Tons*
Adler silt loam, local alluvium	500	800	70	105	20	35	50	80	7.3	10.9	2.1	3.2
Adler and Morganfield silt loams [2]	500	800	70	105	20	35	50	80	7.3	10.9	2.1	3.2
Adler and Morganfield silt loams, local alluvium [2]	500	800	70	105	20	35	50	80	7.3	10.9	2.1	3.2
Alligator clay	400	475	----	50	18	35	35	50	7.3	10.9	2.1	3.2
Alligator silty clay loam	400	475	35	60	18	35	35	55	7.3	10.9	2.1	3.2
Alligator-Dowling association [2]	----	----	----	----	----	----	----	----	7.3	10.9	2.1	3.2
Alluvial land	----	----	----	----	----	----	----	----	7.3	10.9	2.1	3.2
Arkabutla silty clay loam	475	675	55	90	20	35	45	75	7.3	10.9	2.1	3.2
Calloway silt loam, 0 to 2 percent slopes	375	550	35	60	18	32	45	65	4.6	7.9	1.3	2.4
Calloway silt loam, 2 to 5 percent slopes	375	550	35	60	18	32	45	60	4.6	7.9	1.3	2.4
Calloway silt loam, 2 to 5 percent slopes, eroded	375	550	30	55	15	25	40	55	4.6	7.9	1.3	2.4
Collins silt loam	650	850	70	105	25	40	50	80	7.3	10.9	2.1	3.2
Collins silt loam, local alluvium	600	850	70	105	25	40	50	80	7.3	10.9	2.1	3.2
Dowling clay	----	----	----	----	12	20	----	----	4.6	7.9	1.3	4.6
Dundee loam, 0 to 2 percent slopes	625	755	60	90	25	40	52	65	7.3	10.9	2.1	3.2
Dundee silty clay loam, 0 to 2 percent slopes	600	750	60	85	30	40	51	65	7.3	10.9	2.1	3.2
Falaya silt loam	565	725	55	90	20	35	45	75	7.3	10.9	2.1	3.2
Grenada silt loam, 5 to 8 percent slopes	475	635	50	70	18	30	35	65	5.7	9.6	1.6	2.9
Grenada silt loam, 5 to 8 percent slopes, eroded	450	635	45	70	17	25	35	65	5.7	9.6	1.6	2.9
Grenada silt loam, 5 to 8 percent slopes, severely eroded	----	----	----	----	15	20	25	50	4.7	8.0	1.0	2.0
Grenada silt loam, 8 to 12 percent slopes	----	----	----	----	15	24	35	55	5.7	9.6	1.6	2.9
Grenada silt loam, 8 to 12 percent slopes, eroded	----	----	----	----	12	20	25	50	5.7	9.6	1.6	2.9
Grenada silt loam, 8 to 12 percent slopes, severely eroded	----	----	----	----	----	----	----	----	4.7	8.0	1.0	2.0
Grenada-Gullied land complex	----	----	----	----	----	----	----	----	----	----	----	----
Gullied land, sandy	----	----	----	----	----	----	----	----	----	----	----	----
Gullied land, silty	----	----	----	----	----	----	----	----	----	----	----	----
Henry silt loam	----	----	----	----	----	----	----	----	3.6	6.0	1.0	1.8
Loring-Grenada silt loams, 0 to 2 percent slopes [2]	485	725	55	85	25	35	45	75	5.7	9.6	1.6	2.9
Loring-Grenada silt loams, 2 to 5 percent slopes [2]	485	700	55	80	20	35	45	75	5.7	9.6	1.6	2.9
Loring-Grenada silt loams, 2 to 5 percent slopes, eroded [2]	450	700	50	80	18	35	40	70	5.7	9.6	1.6	2.9
Loring-Grenada silt loams, 2 to 5 percent slopes, severely eroded [2]	400	550	45	65	15	28	35	55	4.7	8.0	1.0	2.0
Made land	----	----	----	----	----	----	----	----	----	----	----	----
Memphis silt loam, 2 to 5 percent slopes, eroded	600	825	60	90	30	40	45	75	5.7	9.6	1.6	2.9
Memphis silt loam, 2 to 5 percent slopes, severely eroded	550	725	50	70	20	30	40	60	4.7	8.0	1.0	2.0
Memphis silt loam, 5 to 8 percent slopes, eroded	480	725	50	80	20	30	35	65	5.7	9.6	1.6	2.9
Memphis silt loam, 5 to 8 percent slopes, severely eroded	425	625	35	55	12	20	35	60	4.7	8.0	1.0	2.0
Memphis silt loam, 8 to 12 percent slopes, eroded	----	----	35	55	16	25	35	60	5.7	9.6	1.6	2.9
Memphis silt loam, 8 to 12 percent slopes, severely eroded	----	----	----	----	12	20	----	----	4.7	8.0	1.0	2.0
Memphis silt loam, 12 to 17 percent slopes, eroded	----	----	----	----	----	----	----	----	4.7	8.0	1.0	2.0
Memphis silt loam, 12 to 17 percent slopes, severely eroded	----	----	----	----	----	----	----	----	4.7	8.0	1.0	2.0
Memphis silt loam, 17 to 45 percent slopes	----	----	----	----	----	----	----	----	----	----	----	----
Memphis silt loam, 17 to 45 percent slopes, severely eroded	----	----	----	----	----	----	----	----	----	----	----	----

See footnotes at end of table.

yields of principal crops and pasture

Absence of yield indicates that crop is not suited to the soil specified or is not commonly grown on it or the soil is difficult to manage]

Bahiagrass and legume				Fescue and legume				Dallisgrass and legume				Sericea lespedeza and legume			
Pasture		Hay		Pasture		Hay		Pasture		Hay		Pasture		Hay	
A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Animal-unit-months [1]	*Animal-unit-months* [1]	*Tons*	*Tons*	*Animal-unit-months* [1]	*Animal-unit-months* [1]	*Tons*	*Tons*	*Animal-unit-months* [1]	*Animal-unit-months* [1]	*Tons*	*Tons*	*Animal-unit-months* [1]	*Animal-unit-months* [1]	*Tons*	*Tons*
				4.9	9.6	1.5	2.9	5.4	8.7	1.3	2.5				
				4.9	9.6	1.5	2.9	5.4	8.7	1.3	2.5				
				4.9	9.6	1.5	2.9	5.4	8.7	1.3	2.5				
				4.9	9.6	1.5	2.9	5.4	8.7	1.3	2.5				
				4.9	9.6	1.5	2.9	5.4	8.7	1.3	2.5				
				4.9	9.6	1.5	2.9	5.4	8.7	1.3	2.5				
				4.9	9.6	1.5	2.9	5.4	8.7	1.3	2.5				
				4.9	9.6	1.5	2.9	7.4	11.0	2.0	3.0				
4.6	8.3	1.0	2.5	3.4	6.7	1.2	2.0	4.5	7.0	1.3	2.0	4.0	5.7	1.5	2.1
4.6	8.3	1.0	2.5	3.4	6.7	1.2	2.0	4.5	7.0	1.3	2.0	4.0	5.7	1.5	2.1
4.6	8.3	1.0	2.5	3.4	6.7	1.2	2.0	4.5	7.0	1.3	2.0	4.0	5.7	1.5	2.1
7.7	11.2	2.0	3.0	4.9	9.6	1.5	2.9	7.4	11.0	2.0	3.0				
7.7	11.2	2.0	3.0	4.9	9.6	1.5	2.9	7.4	11.0	2.0	3.0				
				3.4	6.7	1.2	2.0	4.5	7.0	1.3	2.0				
				4.9	9.6	1.5	2.9	7.4	11.0	2.0	3.0				
				4.9	9.6	1.5	2.9	7.4	11.0	2.0	3.0				
7.7	11.2	2.0	3.0	4.9	9.6	1.5	2.9	7.4	11.0	2.0	3.0				
6.0	9.8	1.5	3.0	3.8	8.0	1.0	2.1	5.6	9.0	1.5	2.6	4.2	5.8	2.1	2.5
6.0	9.8	1.5	3.0	3.8	8.0	1.0	2.1	5.6	9.0	1.5	2.6	4.2	5.8	2.1	2.5
4.7	8.5	1.0	2.0									4.0	5.6	1.6	2.4
6.0	9.8	1.5	3.0	3.8	8.0	1.0	2.1	5.6	9.0	1.5	2.6	4.2	5.8	2.1	2.5
6.0	9.8	1.5	3.0	3.8	8.0	1.0	2.1	5.6	9.0	1.5	2.6	4.2	5.8	2.1	2.5
4.7	8.5	1.0	2.0									4.0	5.6	1.6	2.4
3.4	6.2	1.0	2.0												
6.0	9.8	1.5	3.0	3.8	8.0	1.0	2.1	5.6	9.0	1.5	2.6	4.2	5.8	2.1	2.5
6.0	9.8	1.5	3.0	3.8	8.0	1.0	2.1	5.6	9.0	1.5	2.6	4.2	5.8	2.1	2.5
6.0	9.8	1.5	3.0	3.8	8.0	1.0	2.1	5.6	9.0	1.5	2.6	4.2	5.8	2.1	2.5
4.7	8.5	1.0	2.0									4.0	5.6	1.6	2.4
6.0	9.8	1.5	3.0	3.8	8.0	1.0	2.1	5.6	9.0	1.5	2.6	4.2	5.8	2.1	2.5
4.7	8.5	1.0	2.0									4.0	5.6	1.6	2.4
6.0	9.8	1.5	3.0	3.8	8.0	1.0	2.1	5.6	9.0	1.5	2.6	4.2	5.8	2.1	2.5
4.7	8.5	1.0	2.0									4.0	5.6	1.6	2.4
6.0	9.8	1.5	3.0	3.8	8.0	1.0	2.1	5.6	9.0	1.5	2.6	4.2	5.8	2.1	2.5
4.7	8.5	1.0	2.0									4.0	5.6	1.6	2.4
4.7	8.5	1.0	2.0									4.0	5.6	1.6	2.4
4.7	8.5	1.0	2.0									4.0	5.6	1.6	2.4

TABLE 2.—*Estimated average acre yields*

Soil	Cotton		Corn		Soybeans		Oats		Common bermudagrass and legume			
									Pasture		Hay	
	A	B	A	B	A	B	A	B	A	B	A	B
	Lb.	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Animal-unit-months* [1]	*Animal-unit-months* [1]	*Tons*	*Tons*
Memphis-Gullied land complex	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Natchez-Memphis silt loams, 12 to 17 percent slopes [2]	-----	-----	-----	-----	-----	-----	-----	-----	4.7	8.0	1.0	2.0
Natchez-Memphis silt loams, 17 to 50 percent slopes [3]	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Providence silt loam, 8 to 12 percent slopes, severely eroded	-----	-----	-----	-----	-----	-----	-----	-----	4.7	8.0	1.0	2.0
Providence-Ruston complex, 12 to 17 percent slopes [2]	-----	-----	-----	-----	-----	-----	-----	-----	4.7	8.0	1.0	2.0
Providence-Ruston complex, 12 to 17 percent slopes, severely eroded	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Ruston-Providence complex, 17 to 50 percent slopes	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Smoothed silty land	-----	-----	-----	-----	-----	-----	-----	-----	4.7	8.0	1.0	2.0
Wakeland silt loam	567	750	55	90	25	35	45	75	5.7	9.6	1.6	2.9
Waverly silt loam	-----	-----	-----	-----	-----	-----	-----	-----	5.7	7.0	1.5	2.6

[1] The number of months that 1 acre will support 1 cow, horse, or mule; 2 yearlings; 5 ewes with lambs; 5 sows with litters; or 20 weanling pigs without injury to the pasture.

woods, but cultivation and soil erosion have depleted the fertility. Now pines are more economical to grow and easier to manage in much of the county.

Commercial forest land occupies 28 percent of the total land area in Tate County (*11*). According to the Society of American Foresters (*8*), this commercial forest land was originally covered by two forest cover types—the oak-hickory and oak-gum-cypress. Except in areas where pines have been planted or have volunteered after cultivation, the same general pattern of forest cover types exists today.

The oak-hickory forest type occurs in the uplands, especially on soils of the Natchez-Memphis and Ruston-Providence soil associations. On soils of the Ruston-Providence soil association, the predominant tree species are post oak, blackjack oak, southern red oak on the ridgetops and the upper slopes, and white oak and yellow-poplar along the lower slopes, in drainageways, and around the heads of drainageways. Predominant species on soils of the Natchez-Memphis soil association are white oak and Shumard oak on the ridgetops and upper slopes (fig. 11) and cherrybark oak and yellow-poplar on the lower slopes, along drains, and around the heads of drainageways (fig. 12).

The oak-gum-cypress forest type occurs on bottom-land soils, both in the uplands and on the Delta, but it occurs predominantly on soils of the Alligator-Dowling soil association.

In Tate County 52 different soil mapping units are recognized. Woodland does not change or stop at the boundaries of these mapping units, but recognition of the differences in soils and topographic position are significant in woodland management. Managing woodland on the basis of individual kinds of soil, however, is impractical except in a few places.

Woodland suitability groups

Soil-woodland interpretations (ratings) were developed for each mapping unit to show its capability for growing trees and the relative degree of the major limitations and hazards affecting management. The items rated were (1) species suitability, (2) potential productivity of named tree species expressed as average site index, (3) plant competition, (4) equipment limitations, (5) seedling mortality, and (6) erosion hazard. Each item is discussed in the following paragraphs.

Species suitability is shown by listing the major tree species that normally occur on each soil, that are adapted to the soil, and that have the ability to produce quality wood products. The listings are supplied separately in table 3 to indicate those species that are most suitable for favoring in existing stands and those that are most suitable for planting.

Potential productivity is the growth that may be expected from each important tree species or forest type on a soil under a specified kind of management. The most commonly used indicator of potential productivity for trees is *site index*. Site index for a given soil is the height in feet that the dominant and codominant trees growing on that soil in a well-stocked stand will attain at a predetermined age. Height, in feet, at 50 years of age is used in rating all species except cottonwood; height, in feet, at 30 years of age is used in rating cottonwood. Height and

of principal crops and pasture—Continued

Bahiagrass and legume				Fescue and legume				Dallisgrass and legume				Sericea lespedeza and legume			
Pasture		Hay		Pasture		Hay		Pasture		Hay		Pasture		Hay	
A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Animal-unit-months [1]	*Animal-unit-months* [1]	*Tons*	*Tons*	*Animal-unit-months* [1]	*Animal-unit-months* [1]	*Tons*	*Tons*	*Animal-unit-months* [1]	*Animal-unit-months* [1]	*Tons*	*Tons*	*Animal-unit-months* [1]	*Animal-unit-months* [1]	*Tons*	*Tons*
4.7															
4.7	8.5	1.0	2.0									4.0	5.6	1.6	2.4
4.7	8.5	1.0	2.0									4.0	5.6	1.6	2.4
4.7	8.5	1.0	2.0									4.0	5.6	1.6	2.4
				3.8	8.0	1.0	2.1	5.6	9.0	1.5	2.6				
				4.8	7.5	1.5	2.4	5.4	8.7	1.3	2.5				

[2] Predicted yields of soils in this mapping unit are essentially the same.
[3] The soils in this complex are too steep for cultivated crops and pasture.

age measurements were converted to site indexes by applying the results of published research.[4]

Well-stocked, essentially unmanaged stands growing on different kinds of soil were measured to determine the average site index values presented in this soil survey report. Site index may be translated into average annual growth per acre, expressed as board feet, cubic feet, or cords, by the use of appropriate published research.

Plant competition is the rate or speed at which undesirable species invade different sites when openings are made in the tree canopy. It is also referred to as brush encroachment. Plant competition is directly affected by (1) the natural fertility and topographic position of the soil; (2) the degree of erosion; (3) the length of time since the erosion occurred; (4) the length of time the soil has been protected from fire and from harmful grazing; and (5) past management and treatment. The ratings are as follows: *Slight*, competition is no special problem; *moderate*, competition may delay regeneration but usually does not prevent the development of well-stocked stands; and *severe*, competition will likely prevent adequate regeneration of preferred species, and some site preparation is usually needed to insure regeneration.

Equipment limitations are limitations in the use of equipment caused by soil characteristics and topographic conditions. The ratings are as follows: *Slight*, no special problems; *moderate*, seasonal restrictions of less than 3 months or restriction by steep slopes; and *severe*, seasonal restrictions of more than 3 months or special logging methods and equipment are needed because of wetness, topography, or past erosion.

[4] The site index curves used for loblolly and shortleaf pines are from COILE AND SCHUMACHER (*6*). The curves used for sweetgum, cottonwood, cherrybark oak, and water oak are from the Southern Forest Experiment Station (*2*, *3*, *4*, *5*).

Figure 11.—White oak and Shumard oak on uneroded Memphis silt loam.

Figure 12.—**Yellow-poplar, Shumard oak, and cherrybark oak on slightly eroded Memphis silt loam.**

Seedling mortality is the expected mortality as influenced by the soil or topographic conditions when plant competition is not a contributing factor. Seedling mortality is rated for both natural and planted seedlings. Water hazards are considered in rating seedling mortality. The ratings are as follows: *Slight*, no special problems; *moderate*, expected losses do not ordinarily exceed 50 percent; and *severe*, losses of 50 percent or more of the planted stock can be expected and natural regeneration is not reliable.

Erosion hazard is the degree of potential soil erosion if average woodland management practices are used. Among the practices are logging and other operations required for wood-crop production. The ratings are as follows: *Slight*, no special problems; *moderate*, some care is needed in locating roads and skid trails; and *severe*, extreme care is needed in locating roads, skid trails, loading areas, stream crossings, and in the use of skidding methods that minimize soil erosion.

All soils having essentially the same ratings have been placed in a woodland suitability group. The soils in each group produce similar kinds of wood crops, need similar management to produce these crops when the existing stands are the same, and have about the same potential productivity. The 15 woodland suitability groups are discussed in the following pages. Potential productivity, suitable species, and ratings of major hazards and limitations are given for each group in table 3.

WOODLAND SUITABILITY GROUP 1

This group consists of moderately well drained, silty alluvial soils that are slightly acid to mildly alkaline. They have developed in silty loessal materials. The available water capacity is high. The soils are—

(Aa) Adler silt loam, local alluvium.
(Ag) Adler and Morganfield silt loams.
(Am) Adler and Morganfield silt loams, local alluvium.

Hardwoods are best suited to the soils of this group. The most common and preferred species for management are cottonwood, hackberry, sweetgum, sycamore, and pecan. Some other valuable species, including black cherry, black walnut, and cow oak, occur in places and are well suited.

In fields that have been in cultivation, cottonwood is the preferred species if the plantings are properly cultivated the first year. If plantings are not cultivated, loblolly pine is preferred. Hardwoods will invade these plantings, and only one pine rotation can be expected unless expensive measures to control hardwoods are used. If practical planting techniques for hardwoods other than cottonwood are developed, any of the suitable species listed in table 3 for this group may be planted.

The potential productivity of the soils in this group is high. The average site index ratings are 110 to 120 for cottonwood, and 100 to 110 for sweetgum.

Plant competition is moderate. If proper marking and cutting practices are used, natural regeneration of adapted hardwoods is reliable. Plant competition may delay natural regeneration of preferred species but will not usually prevent it.

Equipment limitations are moderate. There is a seasonal restriction on the use of equipment because of wetness. Seedling mortality and the erosion hazard are slight on these alluvial soils.

WOODLAND SUITABILITY GROUP 2

This group consists of poorly drained, nearly level, clayey soils on low bottom lands. They have moderate to high natural fertility and high available water capacity. The soils are—

(Ao) Alligator clay.
(Ar) Alligator silty clay loam.
(As) Alligator-Dowling association (Alligator part).

Hardwoods are best suited to the soils of this group. The most common and preferred species for management are green ash, cottonwood, Nuttall oak, overcup oak, red maple, sweetgum, water oak, and willow oak.

Cottonwood and sweetgum are suitable for field plantings, but need cultivation the first year. Cherrybark oak and Nuttall oak are suitable for planting in openings of existing stands.

Potential productivity of these soils is medium. The average site index ratings are 80 to 90 for cherrybark oak, 75 to 85 for sweetgum, and 70 to 80 for water oak.

Plant competition is moderate to severe. If proper marking and cutting practices are used, natural regeneration is reliable. Plant competition may delay regeneration but will not usually prevent it. For proper growth, desirable species require openings of at least 100 feet between the crowns of surrounding trees.

Equipment limitations are severe. Seasonal restrictions of 3 months or longer because of flooding are common on these soils. Also, special logging equipment may be needed. Seedling mortality is moderate to severe, and the erosion hazard is slight on these nearly level soils.

WOODLAND SUITABILITY GROUP 3

The soils in this group are somewhat poorly and poorly drained, acid, silty alluvial soils. The texture ranges from silt loam to silty clay loam. The available water capacity is high. The soils are—

(Au) Arkabutla silty clay loam.
(Fa) Falaya silt loam.
(Wk) Wakeland silt loam.

The most common preferred species for management are green ash, Nuttall oak, overcup oak, cottonwood, sweetgum, water oak, hackberry, yellow-poplar, sycamore, and loblolly pine.

For planting in fields that have been cultivated, cottonwood is the best suited and preferred species; however, cottonwood cuttings must be cultivated at least once during the first year. Loblolly pine and sweetgum are also suitable for planting in fields. Cherrybark oak and Nuttall oak are suitable for interplanting in existing woodland.

The potential productivity of these soils is moderately high. The site index ratings by species are 105 to 115 for cottonwood, 100 to 110 for sweetgum, 90 to 100 for water oak, and 95 to 105 for loblolly pine.

Plant competition is moderate. If proper marking and cutting practices are used, natural regeneration can be relied on. Plant competition may delay regeneration but will not usually prevent it. For proper growth, desirable species require openings of at least 100 feet between the crowns of surrounding trees.

Equipment limitations are severe. Because of flooding, seasonal restrictions of 3 months or longer are common on the soils. Special logging equipment may be needed for operations that require more than 6 months to log.

Seedling mortality is moderate because of flooding, and the erosion hazard is slight on these nearly level soils.

WOODLAND SUITABILITY GROUP 4

This group consists of moderately well drained and somewhat poorly drained, acid loam and silty clay loam soils on old natural levees of the Delta. They have formed in alluvium deposited by the Mississippi River. The available water capacity is high. The soils are—

(DnA) Dundee loam, 0 to 2 percent slopes.
(DsA) Dundee silty clay loam, 0 to 2 percent slopes.

Hardwoods are best suited to the soils of this group. The most common and preferred species for management are cottonwood, cherrybark oak, Nuttall oak, sycamore, Shumard oak, sweetgum, water oak, pecan, and willow oak.

Cottonwood and sweetgum are suitable for planting in old fields, but they must be cultivated the first year to survive. Nuttall and cherrybark oaks are suitable for interplanting in existing woodland.

The potential productivity of these soils is medium. The average site index ratings are 90 to 100 for cherrybark oak, 85 to 95 for water oak, 100 to 110 for cottonwood, and 90 to 100 for sweetgum.

Plant competition is moderate. If proper marking and cutting practices are used, natural regeneration is reliable. Plant competition may delay regeneration but in most places will not prevent it. For proper growth, the desirable species require openings of at least 100 feet between the crowns of the surrounding trees.

Equipment limitations are moderate. Wetness causes a seasonal restriction, usually less than 3 months, on the use of equipment. Seedling mortality and the erosion hazard are slight.

WOODLAND SUITABILITY GROUP 5

This group consists of somewhat poorly and poorly drained, nearly level to gently sloping, silty soils. The surface layer is silt loam, and the subsoil is silty clay loam or silt loam. A fragipan is at a depth of about 16 inches. The movement of roots and water is retarded in the pan layer. Available water capacity is moderate to low. The soils are—

(CaA) Calloway silt loam, 0 to 2 percent slopes.
(CaB) Calloway silt loam, 2 to 5 percent slopes.
(CaB2) Calloway silt loam, 2 to 5 percent slopes, eroded.
(He) Henry silt loam.

The species best suited to the soils of this group vary because of past use and erosion. The eroded soil in this group has been either cleared and cropped or heavily grazed. The species best suited to this soil is loblolly pine. Hardwoods are best suited to the uneroded soils. The preferred species are willow oak, Shumard oak, sweetgum, water oak, and white oak on nearly level to gently sloping areas. Sweetgum and loblolly pine are best suited to the upland level or nearly level areas. The preferred species for interplanting in existing woodland are cherrybark oak and Shumard oak.

The potential productivity of these soils is medium. The site index ratings for the Calloway soils are 85 to 95 for loblolly pine, 80 to 90 for shortleaf pine, 80 to 90 for cherrybark oak, 85 to 95 for sweetgum, and 75 to 85 for water oak. For the Henry soils, the ratings are about 5 points lower.

Plant competition is the only limitation that is important to this group. The rating is slight to moderate. For pine, on the eroded soil competition is slight and on the noneroded soils it is moderate. If the soils are managed for pine, increasing plant competition develops throughout the rotation. It will become a problem when the stand is regenerated. Periodic control of competition is therefore needed for pine production. For hardwoods, competition is moderate. It may delay regeneration, but it will not usually prevent the establishment of a stand if proper cutting practices are used.

WOODLAND SUITABILITY GROUP 6

This group consists of moderately well drained, acid soils. They have formed in silty loessal alluvium. The available water capacity is high. The soils are—

(Cm) Collins silt loam.
(Co) Collins silt loam, local alluvium.

The most common and preferred species for management are cherrybark oak, cottonwood, Shumard oak, sweetgum, sycamore, red oak, water oak, white oak, Nuttall oak, yellow-poplar, and loblolly pine. Other valuable species, including black cherry, black walnut, and cow oak, occur in places and are well suited.

In fields that have been cultivated, cottonwood is the preferred species; however, plantings must be cultivated at least once and preferably two or three times during the first year. If plantings are not cultivated, loblolly pine is suitable. Hardwoods will invade after the first thinning of the pine stand. Only one pine rotation can be expected

TABLE 3.—*Woodland suitability*

Woodland suitability group	Species suitable for—	
	Favoring in stand	Planting
Group 1: Moderately well drained, silty alluvial soils that are slightly acid to mildly alkaline (Aa, Ag, Am).	Cottonwood, sweetgum, hackberry, pecan, sycamore.	Cottonwood, sweetgum, sycamore.
Group 2: Poorly drained, nearly level, clayey soils on low bottom lands (Ao, Ar, As [2]).	Green ash, cherrybark oak, cottonwood, red maple, Nuttall oak, water oak, sweetgum, overcup oak.	Cottonwood, sweetgum, Nuttall oak, cherrybark oak.
Group 3: Somewhat poorly and poorly drained, acid, silty alluvial soils (Au, Fa, Wk).	Cottonwood, white ash, sweetgum, hackberry, water oak, loblolly pine, sycamore, Nuttall oak, yellow-poplar.	Cottonwood, sweetgum, loblolly pine, cherrybark oak, Nuttall oak.
Group 4: Moderately well drained and somewhat poorly drained, acid loam and silty clay loam soils in alluvium (DnA, DsA).	Cottonwood, cherrybark oak, sweetgum, Nuttall oak, Shumard oak, water oak, pecan, sycamore.	Cottonwood, sweetgum, Nuttall oak, cherrybark oak.
Group 5: Somewhat poorly and poorly drained, acid, silty upland soils (CaA, CaB, CaB2, He).	Loblolly and shortleaf pines, willow oak, sweetgum, cherrybark oak, Shumard oak.	Loblolly pine, Shumard oak, cherrybark oak.
Group 6: Moderately well drained, acid, silty soils in alluvium (Cm, Co).	Cherrybark oak, sycamore, Shumard oak, Nuttall oak, cottonwood, sweetgum, red oak, water oak, loblolly pine, yellow-poplar.	Cottonwood, loblolly pine, cherrybark oak, Shumard oak, sweetgum.
Group 7: Poorly drained, clayey soils in depressions on the Mississippi River flood plain (Dc, As [3]).	Cottonwood, sweetgum, willow oak, ash, tupelo, Nuttall oak, bald cypress, overcup oak.	Bald cypress, water tupelo, black willow.
Group 8: Moderately well drained, silty soils that have a fragipan; slopes range from 0 to 12 percent (GrC, GrC2, GrC3, GrD, GrD2, GrD3, LgA, LgB, LgB2, LgB3, PoD3).	Loblolly pine, shortleaf pine, cherrybark oak, sweetgum, water oak, Shumard oak, white oak, sycamore.	Loblolly pine
Group 9: Deep, well-drained and somewhat excessively drained, gently sloping to steep, silty soils (MeE2, MeE3, MeF3, Mg, Sm, NmE [4], NmF [4]).	Loblolly pine, shortleaf pine	Loblolly pine
Group 10: Poorly drained, acid, silty soil on bottom lands and in depressions (Wv).	Cypress, ash, red oak, white oak, hackberry, cottonwood.	Cottonwood, sweetgum, sycamore, Nuttall oak, cypress.
Group 11: Steep, acid soils (PrE, PrE3, RpF) in three different positions on the landscape as follows:		
1. Ridgetops and upper part of side slopes; dominantly Providence soils.	Loblolly pine, shortleaf pine	Loblolly pine
2. Moderately steep and steep middle and lower slopes; dominantly Ruston soils.	Loblolly pine, shortleaf pine, southern red oak, white oak, yellow-poplar.	Loblolly pine, yellow-poplar.
3. Toe slopes, drainageways, and heads of drainageways; includes several unidentified soils.	Sweetgum, cherrybark oak, Shumard oak, sycamore, chestnut oak, white oak, loblolly pine, shortleaf pine.	Loblolly pine

See footnotes at end of table.

groups of soils

Potential productivity		Plant competition	Equipment limitations	Seedling mortality	Erosion hazard
Commercial tree	Average site index [1]				
Cottonwood	110 to 120	Moderate	Moderate	Slight	Slight.
Sweetgum	100 to 110				
Cherrybark oak	80 to 90	Moderate to severe	Severe	Moderate to severe	Slight.
Sweetgum	75 to 85				
Water oak	70 to 80				
Cottonwood	105 to 115	Moderate	Severe	Moderate	Slight.
Sweetgum	100 to 110				
Water oak	90 to 100				
Loblolly pine	95 to 105				
Cherrybark oak	90 to 100	Moderate	Moderate	Slight	Slight.
Water oak	85 to 95				
Cottonwood	100 to 110				
Sweetgum	90 to 100				
Loblolly pine	85 to 95	Slight to moderate	Slight	Slight	Slight.
Shortleaf pine	80 to 90				
Cherrybark oak	80 to 90				
Sweetgum	85 to 95				
Water oak	75 to 85				
Cottonwood	110 to 120	Moderate	Slight	Moderate	Slight.
Cherrybark oak	105 to 115				
Sweetgum	105 to 115				
Water oak	100 to 110				
Loblolly pine	100 to 110				
Cottonwood	90 to 100	Severe	Moderate; severe	Severe	Slight.
Sweetgum	85 to 95				
Willow oak	80 to 90				
Loblolly pine	80 to 90	Slight to moderate	Slight	Slight	Slight to moderate.
Shortleaf pine	70 to 80				
Cherrybark oak	90 to 100				
Sweetgum	80 to 95				
Water oak	80 to 90				
Loblolly pine on—		Slight to moderate	Moderate to severe	Moderate	Severe to moderate.
Ridgetops and upper slopes	80 to 90				
Lower slopes	90 to 100				
Shortleaf pine on—					
Ridgetops	60 to 70				
Lower slopes	65 to 75				
Cottonwood	95 to 105	Moderate	Severe	Moderate	Slight.
Cherrybark oak	85 to 95				
Water oak	85 to 95				
Willow oak	80 to 90				
Sweetgum	90 to 100				
Loblolly pine	80 to 85	Slight for hardwoods; moderate for pines (slight for the Ruston-Providence complex).	Moderate	Moderate (severe for the Ruston-Providence complex).	Moderate (severe for slopes of more than 25 percent).
Shortleaf pine	65 to 70				
Loblolly pine	85 to 95	Slight for hardwoods; moderate for pines.	Moderate [severe for the Ruston-Providence complex (RpF)].	Slight	Moderate (severe for slopes of more than 25 percent).
Shortleaf pine	65 to 75				
Southern red oak	70 to 80				
White oak	65 to 75				
Sweetgum	80 to 90				
Water oak	75 to 85	Slight	Slight	Slight	Slight.
Sweetgum	85 to 95				
Cherrybark oak	90 to 100				
Loblolly pine	90 to 100				
Shortleaf pine	75 to 85				

TABLE 3.—*Woodland suitability*

Woodland suitability group	Species suitable for—	
	Favoring in stand	Planting
Group 12: Severely eroded and gullied land in sandy and silty material (Gs, Gt, Gu).	Loblolly pine, shortleaf pine	Loblolly pine
Group 13: Somewhat poorly to excessively drained land types that vary in texture (At, Ma).	Selected hardwoods	Selected hardwoods
Group 14: Deep, well-drained, silty soils on steep side slopes, toe slopes, drainageways, and heads of drainageways (MeF, NmE [4], NmF [5]).	Ash, red oak, white oak, sweetgum, yellow-poplar, loblolly pine, shortleaf pine.	Loblolly pine, sweetgum, yellow-poplar, cherrybark oak.
Group 15: Deep, well-drained, silty soils that have slopes of 2 to 12 percent (MeB2, MeB3, MeC2, MeC3, MeD2, MeD3).	Loblolly pine, shortleaf pine	Loblolly pine

[1] Site index is the height in feet that the dominant and codominant trees in a well-stocked stand will attain at a predetermined age. In this table the height is at 50 years for all species except cottonwood, which is 30 years.

unless expensive measures to control hardwoods are used. If practical techniques for planting hardwoods in old fields are developed, any of the adapted species listed above for management may be planted.

Openings of one-fourth acre or more that have been created by proper harvesting of woodland can be planted to cherrybark oak, Shumard oak, sweetgum, and other suitable hardwoods.

The potential productivity on these soils is high. The average site index ratings are 110 to 120 for cottonwood, 105 to 115 for cherrybark oak, 105 to 115 for sweetgum, 100 to 110 for water oak, and 100 to 110 for loblolly pine.

Plant competition is moderate. If proper marking and cutting practices are used, natural regeneration is reliable. Plant competition may delay regeneration, but it will not usually prevent it. For proper growth, desirable species require openings of at least 100 feet between the crowns of the surrounding trees.

Equipment limitations are slight. Because of wetness, there is a seasonal restriction on the use of equipment, usually less than 3 months. Seedling mortality is moderate, and the erosion hazard is slight.

WOODLAND SUITABILITY GROUP 7

This group consists of poorly drained soils in depressions on the Mississippi River flood plain. These soils have heavy, plastic, clayey texture. They contain a large amount of organic matter and have high natural fertility. The available water capacity is high. The soils are—

(Dc) Dowling clay.
(As) Alligator-Dowling association (Dowling part).

Hardwoods are best suited to the soils of this group. The most common preferred species are ash, bald cypress, cottonwood, Nuttall oak, overcup oak, black willow, water tupelo, sweetgum, and willow oak. All species listed in table 3 to favor in management may be considered for planting if practical techniques for planting are developed.

The potential productivity of this group is medium. Average site index ratings are 90 to 100 for cottonwood, 85 to 95 for sweetgum, and 80 to 90 for willow oak.

Plant competition is severe. Natural regeneration of desired species is not reliable. Noncommercial trees and shrubs grow rapidly in openings where the soil is not covered with water.

Equipment limitations are rated moderate except on the Dowling part of the Alligator-Dowling association. Here, frequent flooding causes a seasonal restriction for 3 months or longer on the use of equipment. Special logging equipment may be needed if logging operations last longer than 6 months.

Seedling mortality is severe because of flooding; the erosion hazard is slight.

WOODLAND SUITABILITY GROUP 8

This group consists of moderately well drained soils that have a silt loam surface layer and subsoil and that are underlain by a fragipan at a depth of about 25 inches. These soils are nearly level to strongly sloping. Erosion ranges from slight to severe. The available water capacity is moderate. Water and roots readily penetrate the subsoil above the fragipan but are retarded in the pan. The soils are—

(GrC) Grenada silt loam, 5 to 8 percent slopes.
(GrC2) Grenada silt loam, 5 to 8 percent slopes, eroded.
(GrC3) Grenada silt loam, 5 to 8 percent slopes, severely eroded.
(GrD) Grenada silt loam, 8 to 12 percent slopes.
(GrD2) Grenada silt loam, 8 to 12 percent slopes, eroded.
(GrD3) Grenada silt loam, 8 to 12 percent slopes, severely eroded.
(LgA) Loring-Grenada silt loams, 0 to 2 percent slopes.
(LgB) Loring-Grenada silt loams, 2 to 5 percent slopes.

groups of soils—Continued

Potential productivity		Plant competition	Equipment limitations	Seedling mortality	Erosion hazard
Commercial tree	Average site index [1]				
Loblolly pine Shortleaf pine	65 to 80 60 to 75	Slight	Moderate to severe	Moderate to severe	Severe.
		Moderate	Moderate	Slight to moderate	Slight.
Cherrybark oak Sweetgum Water oak Loblolly pine Shortleaf pine	110 to 120 105 to 115 95 to 105 95 to 105 80 to 90	Severe for planted trees; moderate for natural seedlings.	Moderate to severe	Slight to moderate	Slight.
Loblolly pine on— Upper slopes Lower slopes Shortleaf pine on — Upper slopes Lower slopes	 75 to 85 80 to 90 65 to 75 70 to 80	Slight to moderate	Slight	Moderate to slight	Slight to moderate.

[2] Alligator part of Alligator-Dowling association.
[3] Dowling part of Alligator-Dowling association.
[4] Memphis part of Natchez-Memphis complexes.
[5] Natchez part of Natchez-Memphis complexes.

(LgB2) Loring-Grenada silt loams, 2 to 5 percent slopes, eroded.
(LgB3) Loring-Grenada silt loams, 2 to 5 percent slopes, severely eroded.
(PoD3) Providence silt loam, 8 to 12 percent slopes, severely eroded.

The species best suited to these soils vary according to the degree of erosion. Eroded and severely eroded soils are not suited to the production of hardwoods. Both loblolly and shortleaf pines are suited, but loblolly pine is preferred for management and for planting. On uneroded soils both pines and hardwoods are suited, and pure stands of either can be produced. On these soils management of the established species is usually the simplest and cheapest practice. Among the species to favor on uneroded soils are cherrybark oak, Shumard oak, sweetgum, white oak, and sycamore.

The potential productivity of the soils of this group is medium. The site index ratings are 80 to 90 for loblolly pine and 70 to 80 for shortleaf pine, 90 to 100 for cherrybark oak, 80 to 95 for sweetgum, and 80 to 90 for water oak.

Plant competition, on the average, is only slight on eroded soils that are managed for pines. In most places routine brush and weed control is sufficient to release and maintain pine seedlings. On uneroded soils competition is only slight for mixed hardwoods. Site preparation is needed in areas where pure stands of either pine or of a selected hardwood are to be established. Otherwise, plant competition may become a moderate problem.

Equipment limitations and seedling mortality are slight. The erosion hazard is slight on slopes up to 5 percent and is moderate on slopes of more than 5 percent.

WOODLAND SUITABILITY GROUP 9

This group consists of deep, well-drained and somewhat excessively drained soils. They have a silt loam surface layer over a silt loam or silty clay loam subsoil. Erosion ranges from moderate to severe, and the slopes range from 12 to 50 percent. The available water capacity is high. Roots and water readily penetrate the subsoil. The soils are—

(MeE2) Memphis silt loam, 12 to 17 percent slopes, eroded.
(MeE3) Memphis silt loam, 12 to 17 percent slopes, severely eroded.
(MeF3) Memphis silt loam, 17 to 45 percent slopes, severely eroded.
(Mg) Memphis-Gullied land complex.
(Sm) Smoothed silty land.
(NmE) Natchez-Memphis silt loams, 12 to 17 percent slopes (Memphis part).
(NmF) Natchez-Memphis silt loams, 17 to 50 percent slopes (Memphis part). (The Memphis part of the complex of Natchez-Memphis silt loams occurs on ridgetops and the upper part of side slopes.)

Pines are best suited to the soils of this group. The preferred species is loblolly pine.

The potential productivity of these soils is moderately high. The average site index for loblolly pine is 80 to 90 on ridgetops and the upper part of slopes and 90 to 100 on the lower part of slopes. For shortleaf pine, the average is 60 to 70 on ridgetops and 65 to 75 on the lower part of slopes.

Plant competition is slight to moderate. Because of the natural fertility of these soils, increasing competition from undesirable hardwoods develops throughout the rotation used in management of pines. This competition will become a problem when the pine stand is to be regenerated.

The equipment limitations are moderate on slopes up to 17 percent. They are severe on slopes of 18 percent or more. Seedling mortality is moderate.

The erosion hazard is severe on all soils in this group except Memphis silt loam, 12 to 17 percent slopes, eroded. On this soil it is moderate. Skidding should be done up-

hill on the soils of this group, and skidding pans should be used to reduce soil disturbance.

WOODLAND SUITABILITY GROUP 10

Waverly silt loam (Wv) is the only soil in woodland suitability group 10. It is a poorly drained, acid, nearly level soil on bottom lands and in depressions. This soil contains a small amount of organic matter and has high available water capacity.

Hardwoods are best suited to this soil. The most common preferred species are green ash, bald cypress, cottonwood, Nuttall oak, sweetgum, sycamore, hackberry, cherrybark oak, and water oak. If cottonwood is planted, it must be cultivated at least once during the first year. Sweetgum, Nuttall oak, sycamore, and bald cypress are suitable for planting in woodland openings.

The potential productivity of this soil is moderately high. The average site index ratings are 95 to 105 for cottonwood, 85 to 95 for cherrybark oak, 85 to 95 for water oak, 80 to 90 for willow oak, and 90 to 100 for sweetgum. Plant competition is moderate.

Equipment limitations are severe. Poor drainage and flooding may restrict logging operations for a period of several months.

Seedling mortality is moderate because of flooding. The erosion hazard is slight.

WOODLAND SUITABILITY GROUP 11

This group consists of acid soils in steep, rough, broken areas that have slopes of 12 to 50 percent. Erosion ranges from slight to severe. The soils are—

(PrE) Providence-Ruston complex, 12 to 17 percent slopes.
(PrE3) Providence-Ruston complex, 12 to 17 percent slopes, severely eroded.
(RpF) Ruston-Providence complex, 17 to 50 percent slopes.

The detailed descriptions of the individual soils that make up the soil complexes in this group are given in the section "Descriptions of the Soils." Within these mapping units, there are three different positions on the landscape. The map user must recognize these positions and be able to identify them in the field in order to make useful woodland interpretations.

The first of these three positions consists of ridgetops and the upper part of side slopes. Providence soils are predominant. About 50 percent of the area of the first two mapping units in the list and about 33 percent of the third are in this position.

All species can be planted, but pines are best suited to the areas in this position. The preferred species is loblolly pine.

The potential productivity of the areas in this position is moderately low. The average site index ratings are 80 to 85 for loblolly pine and 65 to 70 for shortleaf pine.

Plant competition is slight for hardwoods and moderate for pine, except on the Ruston-Providence complex. It is slight on this complex. Equipment limitations are moderate.

Seedling mortality is moderate except on the Ruston-Providence complex. It is severe on this complex.

The erosion hazard is moderate except for slopes steeper than 25 percent; it is severe on these slopes.

The second position consists of moderately steep and steep middle and lower parts of slopes. Ruston soils are predominant. About 40 percent of the area of the first two mapping units in the list and about 52 percent of the third are in this position.

All species can be planted. The middle part of these slopes is suited mainly to pines and the preferred species is loblolly pine. The lower part is suited mainly to upland hardwoods. The preferred species are hickory, cherrybark oak, southern red oak, white oak, sweetgum, and yellow-poplar.

The potential productivity of the areas in this position is medium. The average site index ratings are 85 to 95 for loblolly pine, 65 to 75 for shortleaf pine, 70 to 80 for southern red oak, and 80 to 90 for sweetgum.

Plant competition is slight for mixed hardwoods and moderate for pine, and the equipment limitation is moderate except on the Ruston-Providence complex. It is severe for this complex because of the steepness of the slope.

Seedling mortality is slight. The erosion hazard is moderate except on slopes of more than 25 percent; it is severe on those slopes.

The third position consists of toe slopes, drainageways, and heads of drainageways. This position includes several unidentified soils. About 10 percent of the area of the first two mapping units in the list and about 15 percent of the third are in this position.

All species can be planted, but hardwoods are best suited to the areas in this position. The preferred species are sycamore, sweetgum, cherrybark oak, Shumard oak, southern red oak, chestnut oak, white oak, loblolly pine, and shortleaf pine.

The potential productivity is moderately high. The average site index ratings are 90 to 100 for loblolly pine, 75 to 85 for shortleaf pine, 75 to 85 for water oak, 85 to 95 for sweetgum, and 90 to 100 for cherrybark oak.

WOODLAND SUITABILITY GROUP 12

This group consists mostly of severely eroded areas on which an intricate pattern of gullies from 3 to 20 feet deep has formed. Except for a few places between gullies, the original surface layer and subsoil have been washed away. The soil material is acid and ranges from sand to silty clay loam in texture. In many places the soil between the gullies has a compact fragipan. The available water capacity varies. The mapping units are—

(Gs) Grenada-Gullied land complex.
(Gt) Gullied land, sandy.
(Gu) Gullied land, silty.

Pines are best suited to the land types in this group. The preferred species is loblolly, but both loblolly and shortleaf pines are suited.

The potential productivity varies because of differences in soil materials. For the same reason, site index ratings are not given. In general, productivity for pines varies from low to medium.

Plant competition is slight. Equipment limitations are moderate to severe. Special equipment and logging methods are needed in most areas.

Seedling mortality ranges from moderate to severe. As much as 50 percent mortality can be expected within the actively eroding gullies. In areas between the gullies,

mortality will not likely exceed 25 percent during a year of normal rainfall.

The erosion hazard is severe. Excessive disturbance of soil during logging should be avoided, and special care should be taken in locating roads and loading areas.

WOODLAND SUITABILITY GROUP 13

This group consists of somewhat poorly drained to excessively drained land types that vary in texture. The texture ranges from coarse sandy to clayey. The available water capacity varies, but generally it is low. Natural fertility is also low. The land types are—

(At) Alluvial land.
(Ma) Made land.

Hardwoods are best suited to the land types in this group. Because the land types in this group are variable, suitable species and potential productivity are not given. Investigations at the site will be needed to determine the best suited species for planting and management.

The ratings shown in table 3 were made with recognition that areas of these land types are subject to flooding several times yearly and that they are subject to the deposition of alluvium, which may be harmful to planted seedlings.

WOODLAND SUITABILITY GROUP 14

This group consists of deep, well-drained soils that have a silt loam surface layer over a silt loam or silty clay loam subsoil. The erosion is slight. Slopes range from 12 to 50 percent. The available water capacity is high. Roots and water readily penetrate the subsoil. The soils are—

(MeF) Memphis silt loam, 17 to 45 percent slopes.
(NmE) Natchez-Memphis silt loams, 12 to 17 percent slopes (Natchez part).
(NmF) Natchez-Memphis silt loams, 17 to 50 percent slopes. (The Natchez part of the complexes of Natchez-Memphis silt loams is on steep and very steep side slopes and toe slopes.)

Hardwoods are best suited to the soils of this group. On ridgetops and upper slopes the preferred species are cherrybark oak, chinquapin oak, Shumard oak, and white oak. Along middle and lower parts of slopes, in drainageways, and at the heads of drainageways, the preferred species also include ash, blackgum, black cherry, black walnut, southern red oak, sweetgum, water oak, and yellow-poplar.

Cherrybark and other oaks are suitable for planting in openings in woodlands. Loblolly pine, yellow-poplar, and sweetgum are suitable for planting in fields.

The potential productivity of these soils is high. The average site index ratings are 100 to 110 for cottonwood, 110 to 120 for cherrybark oak, 95 to 105 for water oak, 95 to 105 for willow oak, 105 to 115 for sweetgum, 95 to 105 for loblolly pine, and 80 to 90 for shortleaf pine.

Plant competition is severe for planted seedlings and moderate for hardwood seedlings in natural regeneration.

Equipment limitations are moderate to severe because of steepness, gullies, or both. Seedling mortality is rated slight to moderate.

The erosion hazard is slight. Skidding should be done uphill, and skidding pads should be used to reduce soil disturbance. Streams should be crossed at right angles to the stream, and roads should not be adjacent to streams.

WOODLAND SUITABILITY GROUP 15

This group consists of deep, well-drained soils that have a silt loam surface layer over a silt loam or silty clay loam subsoil. Degree of erosion ranges from moderate to severe, and the slopes range from 2 to 12 percent. The available water capacity is high. Roots and water readily penetrate the subsoil. The soils are—

(MeB2) Memphis silt loam, 2 to 5 percent slopes, eroded.
(MeB3) Memphis silt loam, 2 to 5 percent slopes, severely eroded.
(MeC2) Memphis silt loam, 5 to 8 percent slopes, eroded.
(MeC3) Memphis silt loam, 5 to 8 percent slopes, severely eroded.
(MeD2) Memphis silt loam, 8 to 12 percent slopes, eroded.
(MeD3) Memphis silt loam, 8 to 12 percent slopes, severely eroded.

Pines are best suited to the soils of this group. The preferred species is loblolly pine.

The potential productivity of the soils in this group is moderately high. The average site index ratings are 75 to 85 for loblolly pine on upper slopes, 80 to 90 on lower slopes. For shortleaf pine on upper slopes the ratings are 65 to 75, and on lower slopes, 70 to 80.

Plant competition is rated moderate on the eroded soils and slight on the severely eroded soils. Equipment limitations are slight.

Seedling mortality is rated moderate on the eroded soils and slight on the severely eroded soils.

The erosion hazard is rated slight on all soils except Memphis silt loam, 8 to 12 percent slopes, severely eroded. On this soil it is rated moderate.

Use of Soils for Recreation

Because of climate and location, Tate County is well suited to year-round recreation. Among the numerous outdoor activities in the county are golfing, camping, picnicking, hunting, fishing, and boating. Many sites surrounding Arkabutla Reservoir, which has an area of several thousand acres, are suitable for parks and for picnicking and camping. Some sites have already been developed along the lake, and many can be developed along other lakes throughout the county. More recreational areas are needed because of the increasing population of the county and of nearby metropolitan areas around Memphis, Tenn.

In the following paragraphs the principal recreational uses of the soils of the county are discussed, and the limitations and hazards that affect the suitability of the soils for these uses are rated in table 4. The ratings are *slight*, *moderate*, *severe*, and *very severe*. A rating of slight means that the soil has few or no limitations for the use specified or that the limitation can be easily overcome. A rating of moderate indicates that some planning and engineering practices are needed to overcome the limitation. A rating of severe indicates that the soil is poorly suited to the use specified and that intensive engineering practices are needed to overcome the problems. A rating of very severe indicates that the soil is very poorly suited to the use specified and that practices to overcome the limitation are not economically feasible.

TABLE 4.—*Limitations of soils for developed recreational uses*

[The ratings of the limitations are explained in the text]

Soil	Limitation for—				
	Campsites	Golf fairways	Picnic areas	Intensive play areas	Trafficways
Adler silt loam, local alluvium	Moderate	Moderate	Moderate	Moderate	Moderate.
Adler and Morganfield silt loams [1]	Moderate	Moderate	Moderate	Moderate	Moderate.
Adler and Morganfield silt loams, local alluvium [1]	Moderate	Moderate	Moderate	Moderate	Moderate.
Alligator clay	Severe	Severe	Severe	Severe	Severe.
Alligator silty clay loam	Severe	Severe	Severe	Severe	Severe.
Alligator-Dowling association [2]	Severe	Severe	Severe	Severe	Severe.
Alluvial land [3]					
Arkabutla silty clay loam	Severe	Severe	Moderate	Moderate	Moderate.
Calloway silt loam, 0 to 2 percent slopes	Severe	Severe	Moderate	Moderate	Moderate.
Calloway silt loam, 2 to 5 percent slopes	Moderate	Moderate	Moderate	Moderate	Moderate.
Calloway silt loam, 2 to 5 percent slopes, eroded	Moderate	Moderate	Moderate	Moderate	Moderate.
Collins silt loam	Moderate	Moderate	Moderate	Moderate	Moderate.
Collins silt loam, local alluvium	Severe	Severe	Severe	Severe	Severe.
Dowling clay	Severe	Severe	Severe	Severe	Severe.
Dundee loam, 0 to 2 percent slopes	Moderate	Moderate	Moderate	Moderate	Moderate.
Dundee silty clay loam, 0 to 2 percent slopes	Moderate	Moderate	Moderate	Moderate	Moderate.
Falaya silt loam	Severe	Severe	Moderate	Moderate	Moderate.
Grenada silt loam, 5 to 8 percent slopes	Moderate	Moderate	Moderate	Moderate	Moderate.
Grenada silt loam, 5 to 8 percent slopes, eroded	Moderate	Moderate	Moderate	Moderate	Moderate.
Grenada silt loam, 5 to 8 percent slopes, severely eroded.	Moderate	Moderate	Moderate	Moderate	Moderate.
Grenada silt loam, 8 to 12 percent slopes	Moderate	Moderate	Moderate	Moderate	Moderate.
Grenada silt loam, 8 to 12 percent slopes, eroded	Moderate	Moderate	Moderate	Moderate	Moderate.
Grenada silt loam, 8 to 12 percent slopes, severely eroded.	Moderate	Moderate	Moderate	Moderate	Moderate.
Grenada-Gullied land complex:					
Grenada part	Moderate	Moderate	Moderate	Moderate	Moderate.
Gullied land part	Severe	Severe	Severe	Very severe	Severe.
Gullied land, sandy	Severe	Severe	Severe	Very severe	Severe.
Gullied land, silty	Severe	Severe	Severe	Very severe	Severe.
Henry silt loam	Severe	Severe	Severe	Very severe	Severe.
Loring-Grenada silt loams, 0 to 2 percent slopes:					
Loring part	Slight	Slight	Slight	Slight	Moderate.
Grenada part	Moderate	Moderate	Moderate	Moderate	Moderate.
Loring-Grenada silt loams, 2 to 5 percent slopes:					
Loring part	Slight	Slight	Slight	Slight	Moderate.
Grenada part	Moderate	Moderate	Moderate	Moderate	Moderate.
Loring-Grenada silt loams, 2 to 5 percent slopes, eroded:					
Loring part	Slight	Slight	Slight	Slight	Moderate.
Grenada part	Moderate	Moderate	Moderate	Moderate	Moderate.
Loring-Grenada silt loams, 2 to 5 percent slopes, severely eroded:					
Loring part	Moderate	Moderate	Moderate	Moderate	Moderate.
Grenada part	Moderate	Moderate	Moderate	Moderate	Moderate.
Made land [3]					
Memphis silt loam, 2 to 5 percent slopes, eroded	Slight	Slight	Slight	Slight	Slight.
Memphis silt loam, 2 to 5 percent slopes, severely eroded.	Slight	Slight	Slight	Slight	Slight.
Memphis silt loam, 5 to 8 percent slopes, eroded	Moderate	Moderate	Slight	Moderate	Slight.
Memphis silt loam, 5 to 8 percent slopes, severely eroded.	Moderate	Moderate	Slight	Moderate	Slight.
Memphis silt loam, 8 to 12 percent slopes, eroded	Moderate	Moderate	Slight	Moderate	Slight.
Memphis silt loam, 8 to 12 percent slopes, severely eroded.	Moderate	Moderate	Moderate	Moderate	Slight.
Memphis silt loam, 12 to 17 percent slopes, eroded	Severe	Severe	Moderate	Severe	Moderate.
Memphis silt loam, 12 to 17 percent slopes, severely eroded.	Severe	Severe	Moderate	Severe	Moderate.
Memphis silt loam, 17 to 45 percent slopes	Severe	Severe	Severe	Very severe	Severe.
Memphis silt loam, 17 to 45 percent slopes, severely eroded.	Severe	Severe	Severe	Very severe	Severe.
Memphis-Gullied land complex:					
Memphis part	Severe	Severe	Severe	Very severe	Severe.
Gullied land part [3]					
Natchez-Memphis silt loams, 12 to 17 percent slopes [4]	Severe	Severe	Moderate	Severe	Moderate
Natchez-Memphis silt loams, 17 to 50 percent slopes [4]	Severe	Severe	Severe	Severe	Severe.

See footnotes at end of table.

TABLE 4.—*Limitations of soils for developed recreational uses*—Continued

Soil	Limitation for—				
	Campsites	Golf fairways	Picnic areas	Intensive play areas	Trafficways
Providence silt loam, 8 to 12 percent slopes, severely eroded.	Moderate	Moderate	Slight	Moderate	Moderate.
Providence-Ruston complex, 12 to 17 percent slopes [5]	Severe	Severe	Moderate	Severe	Moderate.
Providence-Ruston complex, 12 to 17 percent slopes, severely eroded. [5]	Severe	Severe	Moderate	Severe	Moderate.
Ruston-Providence complex, 17 to 50 percent slopes [5]	Severe	Severe	Severe	Severe	Severe.
Smoothed silty land [3]					
Wakeland silt loam	Severe	Severe	Moderate	Moderate	Severe.
Waverly silt loam	Severe	Severe	Severe	Severe	Severe.

[1] The limitations for the Adler and for the Morganfield soils in this unit are the same.
[2] The limitations for the Alligator and for the Dowling soils in this unit are the same.
[3] Not rated, as properties are variable.
[4] Slope is the main limitation for the Natchez and Memphis soils in this unit, and their ratings are the same.
[5] Slope is the main limitation for the Providence and Ruston soils in this unit, and their ratings are the same.

Campsites.—A campsite should be suitable for tents and the accompanying activities of outdoor living for a few weeks. The major factors used to rate soils in table 4 for their suitability for campsites are the slope, trafficability, and inherent erodibility. Little preparation of the soils at the site should be necessary. The soils should be capable of producing good growth of trees and grass and have an attractive landscape. They should not be naturally wet and should have good foot trafficability.

Golf fairways.—The soils are rated in table 4 only for golf course fairways. They are not rated for the rough or for other hazards because many kinds of soils are suitable for these parts of the golf course. Also, the soils are not rated for greens, which are man made. The suitability of the soil for fairways depends mainly on the ability of the soil to withstand traffic on foot and from golf carts, especially soon after rain. Other factors considered in the rating are the amount of coarse rock fragments or large rock outcrops, the productivity, and the slope.

Picnic areas.—Picnic tables and a fireplace are furnished at most picnic areas (fig. 13); otherwise, little preparation is needed. The major requirements are an attractive landscape and good trafficability. Other important properties to be considered are the slope and the inherent erodibility of the soil.

Intensive play areas.—These are areas developed for playgrounds and for baseball, tennis, badminton, and other organized games. These areas are subject to much foot traffic and generally require a soil that is nearly level, has good drainage, and has a texture and consistency that provide a firm surface. The soil should not have coarse fragments and rock outcrops. Generally less than 2 acres are needed for these areas.

Trafficways.—Trafficways are areas that can be developed as roads and trails at low cost. The construction involves cuts and fills of limited size as well as limited preparation of the subgrade. The major considerations in rating soils for trafficways are the slope, depth to the water table, flood hazard, erodibility, and traffic-supporting capacity.

Natural parks.—The soils of Tate County are not rated in table 4 for natural parks. An extremely wide range of the soils are suitable for this use. Nature trails, hiking trails, bridle paths, picnic areas, campsites, and intensive play areas can all be developed on large areas reserved for parks.

Use of Soils for Wildlife [6]

This section consists of two main parts. In the first part, wildlife resources, and the kinds and requirements of wildlife are discussed. In the second part, specific information is given about the management of wildlife habitats by soil associations, as shown on the General Soil Map.

Wildlife resources

The original forest of Tate County supported great numbers of deer, bears, panthers, wolves, and smaller animals. Deer and beavers are now returning to wooded areas, especially on the Delta. There are about 68,000 acres of woodland in the county. The wooded areas are generally too steep or too eroded to be cultivated, or they are frequently flooded.

Because of the rough landscape and well-distributed food supply, the county supports many species of wildlife. Adequate water for wildlife is provided by Arkabutla Reservoir (fig. 14), farm ponds, and pools behind detention dams constructed through the Soil Conservation District and Flood Prevention Programs. These sources also provide excellent fishing.

Tate County is within an hour's drive of Memphis, Tenn., and landowners therefore have exceptional opportunities to increase their income by the sale of hunting privileges. Most areas have well-drained surface soils and are suited to hunting either on foot or on horseback throughout the season.

Principal kinds of wildlife and their requirements

The principal kinds of wildlife in the county are bobwhites, deer, doves, ducks, rabbits, squirrels, nongame

[6] This section was prepared by EDWARD G. SULLIVAN, biologist, Soil Conservation Service.

Figure 13.—**One of several picnic areas that was developed by the Corps of Engineers near Arkabutla Reservoir. The soil is Memphis silt loam, 5 to 8 percent slopes, severely eroded.**

birds, and fish. The type of vegetation and the land use in the different parts of the county determine the kinds and numbers of wildlife. The quality, quantity, and management of farm ponds determine the kinds and numbers of fish.

Wildlife

Some kinds of wildlife are adapted to woodland, some to wetland, and some to open land, but most kinds need a combination of these habitats. Farm game species—bobwhites, doves, and rabbits—are adapted to open land. These species are more commonly associated with row-crop farming than with livestock farming. Forest game species—squirrels, deer, and turkeys—thrive in woodlands where part of the stand is hardwoods. Some of the extensive woodlands on the Delta and in the bluff areas of western Tate County are particularly suited to forest game. Ducks are naturally limited to lakes, bayous, and streams—primarily those on the Delta—and to Arkabutla Reservoir. Ducks also frequent smaller streams, farm ponds, and beaver ponds. The requirements of the principal kinds of wildlife in the county are discussed in the following paragraphs.

Bobwhites.—Bobwhites, or quail, need open and semiopen land where ample food is available. The food should be near sheltering vegetation to protect the birds from predators and from adverse weather. This kind of habitat exists primarily in areas that are row cropped. The choice foods of bobwhites consist of acorns, beechnuts, blackberries, browntop millet, black cherries, corn, cowpeas, croton seeds, flowering dogwood berries, lespedeza (bicolor, Kobe, Korean, and common), mulberries, pine seeds, partridge pea, ragweed seeds, soybeans, sweetgum seeds, and tickclover (beggarticks). They also eat insects in the warm seasons.

Deer.—Woodland habitats that consist of 500 acres or more and have plenty of water are necessary for deer. Deer eat a wide variety of foods. Their choice foods are acorns, clover, corn, cowpeas, greenbriers, honeysuckle, oats, rescuegrass, and wheat. Many other native forage plants are also eaten.

Doves.—The choice foods of doves are seeds, for example, browntop millet, corn, croton, grain sorghum, panicgrass, pine seeds, pokeberry, ragweed, sunflower, sweetgum, and wheat. Doves require open fields that have a thin ground cover for feeding. They require water daily.

Ducks.—Areas of natural water or fields and woodlands that can be flooded in winter are necessary for ducks. Their choice foods are acorns, beechnuts, browntop millet, corn, Japanese millet, and smartweed seeds.

Rabbits.—An adequate cover of vegetation is the primary habitat requirement for rabbits. Good cover plants are blackberry briers, multiflora rose, sericea lespedeza, and any low-growing brush, shrubs, or annual weeds. Their foods are primarily grasses, clovers, grain, and the bark of trees and shrubs.

Squirrels.—Woodlands of a few acres or more are needed to support squirrels. Hardwoods are required in the stand. The choice foods of squirrels are acorns, beechnuts, blackgum seeds, black cherries, corn, dogwood seeds, hickory nuts, mulberries, maple seeds, pecans, and pine seeds.

Nongame birds.—Many species of nongame birds occur in all habitats. Their foods and nesting requirements vary widely between species. Some eat nothing but insects; a few eat a combined diet of insects and fruits; and several eat insects along with acorns, nuts, or fruits.

Fish.—The principal game fish in the ponds and streams of Tate County are bass, bluegills and other sunfish, and channel catfish. Bluegills and most of the sunfish eat aquatic worms, insects, and insect larvae. Bass and catfish eat small fish, frogs, crayfish, and other aquatic forms of life. The amount of fishfood available and the poundage of usable fish produced in ponds are related to the fertility of the watershed and of the pond bottom. In most ponds fertilizer and lime are needed to produce a good poundage of fish.

Management of wildlife habitats by soil associations

The various kinds of wild birds and animals in an area are related indirectly to the soils. They require certain kinds of food and cover that usually grow in plant associations that are related directly to a soil or a group of soils. Likewise, the quality and fertility of natural and impounded water are dependent on the kind of soils in the lake or stream and on the watershed above it, or on supplemental fertilization.

In this section the suitability and management of soils and plants for fish and wildlife in Tate County are discussed by soil associations, as shown on the General Soil Map. If the wildlife habitats and management practices are similar in two soil associations, they are discussed together.

Figure 14.—**A view of Arkabutla Reservoir and some surrounding landscape. Many good recreational areas are on the lake, which provides excellent fishing.**

ALLIGATOR-DOWLING ASSOCIATION

The Alligator-Dowling association is made up of poorly drained, heavy, clayey soils on the Mississippi River flood plain, commonly called the Delta. It occurs along the western edge of the county between the bluffs and the Coldwater River. Much of this area is in a stand of mixed hardwoods. The farms in this association are large, and the principal agricultural crops are cotton, soybeans, and rice.

The habitat for farm game is limited. Bobwhites are present near row-crop fields but intensive agricultural practices limit their number. Native cover left along fences, ditches, and field edges, and soybeans and other food left adjacent to the cover, will benefit bobwhites. Also, adapted food plants may be planted.

Cottontail rabbits are plentiful in fields if enough cover is available. Swamp rabbits are abundant throughout the area, both on farms and in woodlands.

Trees that make up a squirrel and deer habitat are well suited to the soils of this association. The mixed hardwoods furnish food and cover. A woodland management program will help to maintain a good number of deer and squirrels. Good cutting practices, such as harvesting mature trees in small blocks, create openings in the woodland that produce deer browse. Some mature mast-producing trees, particularly oaks, should be left in the stand at all times for woodland wildlife.

Low areas that hold water through the winter are numerous. These areas attract ducks. Many sites, where duck-feeding areas can be constructed, are also available, either in open, planted fields or in woodlands. Browntop millet and Japanese millet are suitable for planting in open fields that can be flooded in winter. Woodlands where as much as 50 percent of the stand is oaks and the topography is suitable for winter flooding will supply the food needed by ducks through the winter. A low levee can be con-

structed to hold a depth of 6 to 24 inches of water. Winter flooding will not damage the hardwoods.

Most soils in this association hold water well, and good fish production can be expected from constructed ponds. Most ponds in this area must be dug and a levee built around them high enough to keep out floodwater.

CALLOWAY-HENRY ASSOCIATION

The Calloway-Henry association comprises somewhat poorly drained to poorly drained, silty upland soils that cover only a small part of the county. It occurs in small areas scattered throughout the hilly section and on broad, nearly level areas adjacent to the flood plains of the major streams.

Few farms are entirely within this association. About the same acreage is used for pasture as for cropland. The soils of this association are not among the best agricultural soils in the county.

Because the soils of this association are in small isolated areas, the kinds of wildlife are about the same as those in adjacent soil associations. Where the soils are in woodland, the trees are mostly hardwoods. Squirrels and deer do well here if the stand is managed to favor their foods. Duck fields can be managed on these soils if water is available for flooding. Japanese millet is the best plant to use for duck fields on these poorly drained soils.

Farm game inhabit the areas of this association that are in row crops. Natural cover plants and some of the natural food plants grow around field edges and on ditchbanks. Bobwhite foods grow where adequate drainage is provided.

COLLINS-FALAYA ASSOCIATION AND ADLER-MORGANFIELD-WAKELAND ASSOCIATION

These associations consist of nearly level bottom lands along the streams throughout the county. The wildlife habitats and management practices are similar in both associations. Most of the acreage is used for row crops; a smaller acreage is used for pasture. These associations are in a highly productive farming area.

Farm game species—bobwhites, rabbits, and doves—are suited to these associations and are present in areas where food and cover are suitable. As the soils of these associations are intensively farmed, the numbers of wildlife depend on the consideration given by landowners to the requirements of game species.

Bobwhites, or quail, need to have food and cover plants spaced well over the farm. Annual lespedeza and other native legumes grow well. Millet, soybeans, cowpeas, and bicolor lespedeza are suited to these soils. Cover plants along fencerows, ditchbanks, and in small idle areas furnish natural cover and food. For large numbers of bobwhites, it may be necessary to plant suitable food crops to supplement the natural food.

Rabbits thrive where the cover plants suitable for bobwhites are provided. Also, small patches and strips of winter forage adjacent to the cover provide rabbits with food.

Doves do well in this area. Waste grain and field weeds furnish their food. Browntop millet and Texas millet produce well on these soils. Farms on which row crops are grown furnish a good food supply for doves.

The trees in these associations are hardwoods, which provide squirrels with food. Deer do well if there is enough acreage in timber to support them. A management program that maintains part of the stand in mature hardwoods at all times is necessary for providing food for forest game.

Good sites for duck fields are numerous. The soils hold water for winter flooding and produce good crops of browntop millet and Japanese millet. There are woodland sites in these associations that can be flooded in winter to feed ducks.

Because of the topography, these associations are not generally well suited to fish ponds. If suitable sites for ponds are found, ponds can be constructed that hold water and produce fish. Most of these ponds would be of the dug-out or levee type.

GRENADA-LORING ASSOCIATION AND MEMPHIS ASSOCIATION

These associations occur throughout the county in gently sloping to steep, long, narrow valleys. The wildlife habitats and management practices are the same for both. Much of the acreage of these associations is in pasture.

The soils of these associations are particularly suited to farm game. Livestock farming, however, limits the number of game animals because the pastures lack food and cover plants. Livestock farmers who are interested in producing more game can provide necessary food and cover plants.

The soils are well suited to legumes and woolly croton. Blackberries, shrubs, and other cover plants grow well on these soils. Annual lespedeza grows in pastures. If cover food and plants are allowed to grow along fences, steep places, and along ditchbanks and streambanks, bobwhites are usually present. Where the soil in pasture has been worked, strips and patches of woolly croton grow and provide food for bobwhites and doves.

Rabbits thrive in pasture wherever plants suitable for bobwhites are provided.

Squirrels inhabit small and large areas of hardwoods that are old enough to produce their food. Maintenance of choice food trees will assure a good number of squirrels. The larger wooded tracts are suitable for deer.

Because of steepness, the soils of these associations are not suitable for flooded duck fields. The soils and topography, however, are suitable for the construction of lakes and ponds. Ponds on these soils, if kept properly fertilized, will produce 300 to 400 pounds of fish per acre yearly.

NATCHEZ-MEMPHIS ASSOCIATION

The Natchez-Memphis association is an area of steep to very steep hills and ridges in the western part of the county adjacent to the Delta.

Most of this association is in hardwoods and is very well suited to forest game. There are many squirrels throughout the association, and many deer in most parts. A good management program for hardwoods is needed to keep these animals plentiful. Small areas should be clear cut (harvested) periodically to favor browse plants for deer. Some mature trees should be left in the stand at all times to insure a supply of acorns and other wildlife foods.

RUSTON-PROVIDENCE ASSOCIATION

The Ruston-Providence association is in the eastern part of the county in steep to very steep, rough, broken areas. It is mostly in trees.

This association is fairly well suited to squirrels, bob-

whites, and rabbits. Bobwhites and rabbits are limited primarily to the cleared areas where there is food and cover. Annual lespedeza and other native legumes grow well on these soils. Cover plants grow abundantly if given a chance. Natural cover for these animals is needed in pastures. In areas suitable for cultivation, these soils will grow croton, bicolor lespedeza, millet, soybeans, and cowpeas as food for bobwhites.

Trees are mostly hardwoods and will produce enough food for squirrels if well managed. Some of the soils in this association will not hold water and are not suitable for ponds. Before a pond or lake is constructed in this area, a thorough investigation of the soil conditions should be made.

Engineering Uses of the Soils[6]

This section is mainly a discussion of soil as a construction material. By laboratory tests and extrapolation, properties important to engineers were determined or estimated for all the soils of the county.

Engineers can use the information contained in this and other sections of this report to—

1. Make soil and land use studies that are necessary for the selection and development of industrial, business, residential, and recreational sites.
2. Help in designing drainage and irrigation structures and in planning dams and other structures for soil and water conservation.
3. Make preliminary evaluations of soil and ground conditions that are necessary in selecting highway, pipeline, and airport locations.
4. Locate sand for use in construction.
5. Correlate performance of engineering structures with types of soil and thus develop information useful in design and maintenance of structures.
6. Determine the trafficability of various soils for cross-country movement of vehicles and construction equipment.
7. Supplement information from other sources for the purpose of making soil maps and reports that can be readily used by engineers.

The engineering interpretations reported here can be useful for many purposes. It should be emphasized, however, that they may not eliminate the need for sampling and testing at the site of specific engineering works involving heavy loads and where the excavations are deeper than the depth of layers here reported. Even in these situations, the soil map is useful for planning more detailed field investigations and for suggesting the kinds of problems that may be expected.

In addition to this section, other sections of the report, including "Descriptions of the Soils" and "Formation and Classification of the Soils," may be of interest to engineers.

Engineers may not be familiar with all terms used by soil scientists. Most of these terms are defined in the Glossary at the back of this report.

[6] Engineers of the Mississippi State Highway Department and the Soil Conservation Service collaborated with soil scientists of the Soil Conservation Service in preparing this section. The narrative part was written by EMMETT M. BOLAND, agricultural engineer, Soil Conservation Service.

Soil test data, engineering properties of the soils, and interpretations

To be able to make the best use of the soil maps and the soil survey report, engineers should know the properties of the soil materials and the condition of the soil in place. Tables 5 and 6 in this section contain, respectively, a summary of soil properties significant to engineering and some engineering interpretations.

Samples of Calloway silt loam, Collins silt loam, Grenada silt loam, Henry silt loam, Loring silt loam, and Memphis silt loam were tested in accordance with standard procedures (*1*) and the results were published in the De Soto County soil survey report (*12*). These samples are representative of the same soils in Tate County and were used in evaluating the soils of Tate County for engineering purposes.

Brief descriptions and estimated physical and chemical properties of the soils of Tate County are given in table 5. The estimates are based on the results of laboratory tests and on field observations and experience with soils in engineering structures.

In table 5 soil texture is described according to the classification used by the U.S. Department of Agriculture (*9*), the Unified classification developed by the Corps of Engineers, U.S. Army (*15*), and the system used by the American Association of State Highway Officials (AASHO) (*1*).

In the system used by scientists of the Department of Agriculture, the texture of a soil horizon (layer) depends on the proportional amounts of the different sized mineral particles. The soil materials are identified as cobblestones, gravels, sands, silts, and clays. Rarely does a soil consist of only one particle size, but a particle size might so dominate in a soil that the soil would exhibit the characteristics of material composed of that particle size. For example, a soil that consists of 40 percent clay is called *clay* and characteristically feels slick, sticky, and plastic when wet. The texture of a soil is closely associated with its workability, fertility, permeability, erodibility, and other important characteristics. Representative textural groups from finest to coarsest are: (1) fine-textured soils (*clay, silty clay, sandy clay*); (2) medium-textured soils (*loam, silt loam, very fine sandy loam*); and (3) coarse-textured soils (*loamy fine sand, loamy sand, sand, coarse sand*).

In the AASHO system soils are classified in seven principal groups. The groups range from A-1, consisting of soils with high bearing capacity, to A-7, consisting of clayey soils having low strength and stability when wet.

In the Unified soil classification system, soil materials are identified as coarse grained (8 classes), fine grained (6 classes), or highly organic (1 class).

In table 5 are estimated engineering properties of the soils and estimated engineering classifications by the AASHO and Unified systems. These estimates are based on experience with the soils of the county and on data obtained by testing samples of Calloway silt loam, Collins silt loam, Grenada silt loam, Henry silt loam, Loring silt loam, and Memphis silt loam, soils in De Soto County (*12*). In those tests, liquid and plastic limits were determined, and mechanical analysis of soil separates was performed by the combined sieve and hydrometer methods.

Liquid and plastic limits indicate the consistency of a soil material under varying moisture conditions. As the

TABLE 5.—*Brief descriptions of the soils and their*

Symbol on map	Soil name	Description of soil and site	Depth from surface
			Inches
Aa	Adler silt loam, local alluvium.	Moderately well drained and well drained friable silt loam alluvium 4 to 6 feet thick; seasonally high water table at depth of 1½ to 3 feet.	0–40
Ag	Adler and Morganfield silt loams.[1]		
Am	Adler and Morganfield silt loams, local alluvium.[1]		
Ao	Alligator clay.	About 4 to 20 feet of clay alluvium; some areas have a surface layer of silty clay loam sediment that is ½ foot thick; high water table near the surface.	0–48
Ar	Alligator silty clay loam.		
As	Alligator-Dowling association.[1]		
At	Alluvial land.[2]	Bottom land of variable texture; alternate layers of silty and sandy material; seasonally high water table at depth of ½ to 1½ feet.	
Au	Arkabutla silty clay loam.	Somewhat poorly drained silty clay loam alluvium more than 4 feet thick; seasonally high water table between surface and depth of 1½ feet.	0–48
CaA	Calloway silt loam, 0 to 2 percent slopes.	Somewhat poorly drained soil consisting of about ½ foot of silt loam, over 1 foot of silty clay loam or heavy silt loam; fragipan 2 to 3 feet thick; seasonally high water table at depth of ½ to 1½ feet.	0–8
CaB	Calloway silt loam, 2 to 5 percent slopes.		8–18
CaB2	Calloway silt loam, 2 to 5 percent slopes, eroded.		18–45
			45–60
Cm	Collins silt loam.	Moderately well drained silt loam alluvium 4 to 8 feet thick; seasonally high water table at depth of 1½ to 3½ feet.	0–52
Co	Collins silt loam, local alluvium.		
Dc	Dowling clay.	About 4 to 20 feet of clay alluvium; high water table near the surface.	0–48
DnA	Dundee loam, 0 to 2 percent slopes.	About ½ foot of loam to silty clay loam, over 1½ to 2 feet of silty clay loam to loam, underlain by fine sandy loam or silt loam; high water table at depth of about 1½ to 2½ feet.	0–4
DsA	Dundee silty clay loam, 0 to 2 percent slopes.		4–22
			22–50
Fa	Falaya silt loam	Somewhat poorly drained to poorly drained silt loam alluvium more than 4 feet thick; stratified with silty clay loam in some areas; seasonally high water table between surface and depth of 1½ feet.	0–45
GrC	Grenada silt loam, 5 to 8 percent slopes.	Moderately well drained to well drained silt loam about 1 foot thick, over 1 to 1½ feet of heavy silt loam or silty clay loam; silt loam fragipan 2 to 3 feet thick, underlain by silt loam; seasonally high water table at depth of 1½ feet to more than 4 feet.	0–13
GrC2	Grenada silt loam, 5 to 8 percent slopes, eroded.		13–24
GrC3	Grenada silt loam, 5 to 8 percent slopes, severely eroded.		24–60
GrD	Grenada silt loam, 8 to 12 percent slopes.		60–72
GrD2	Grenada silt loam, 8 to 12 percent slopes, eroded.		
GrD3	Grenada silt loam, 8 to 12 percent slopes, severely eroded.		
Gs	Grenada-Gullied land complex.[2]	Moderately well drained and well drained upland soils that are very severely gullied; deep gullies at frequent intervals; fingers of soil between gullies are Grenada or Memphis.	
Gt	Gullied land, sandy.[2]	Sandy or silty upland soils that have eroded into an intricate network of gullies.	
Gu	Gullied land, silty.[2]		
He	Henry silt loam.	Poorly drained silt loam about ½ foot thick, over about ½ to 1 foot of heavy silt loam; fragipan slight to dense; seasonally high water table at or near the surface.	0–4
			4–12
			12–40
			40–52

See footnotes at end of table.

estimated physical and chemical properties

Classification			Percentage passing sieve—		Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
USDA texture	Unified	AASHO	No. 10	No. 200					
					Inches per hour	*Inches per inch of soil*	*pH value*		
Silt loam	ML or ML–CL.	A–4	100	90–100	0. 80–2. 50	0. 24–0. 30	6. 6–8. 4	High	Low to moderate.
Silty clay to clay.	CH	A–7	100	80–100	0. 00–0. 05	0. 20–0. 27	5. 6–7. 8	Low	High.
Silty clay loam	CL	A 6	100	90–100	0. 80–2. 50	0. 24–0. 28	4. 5–6. 1	Moderate	Moderate.
Silt loam	ML or ML–CL.	A–4	100	90–100	0. 80–2. 50	0. 24–0. 30	4. 5–5. 5	High	Low to moderate.
Silt loam to silty clay loam.	ML or CL	A–6 or A–7.	100	90–100	0. 80–2. 50	0. 24–0. 28	4. 5–5. 5	Moderate to high.	Moderate.
Silt loam	ML or CL	A–4 or A–6.	100	90–100	0. 00–0. 05		4. 5–5. 5	High	Low to moderate.
Silt loam	ML or CL	A–4 or A–6.	100	90–100	0. 80–2. 50	0. 24–0. 30	4. 5–5. 5	High	Low to moderate.
Silt loam	ML or ML–CL.	A–4	100	90–100	0. 80–2. 50	0. 24–0. 30	5. 1–6. 5	High	Low.
Clay	CH	A–7	100	80–100	0. 00–0. 05	0. 20–0. 27	5. 6–7. 8	Low	High.
Loam to silty clay loam.	ML or CL	A–4 or A–6.	100	80–100	0. 80–2. 50	0. 20–0. 24	4. 5–6. 0	High	Low to moderate.
Silty clay loam	CL	A–6 or A–7.	100	85–100	0. 80–2. 50	0. 22–0. 26	4. 5–6. 0	Moderate to low.	Moderate.
Very fine silty clay loam.	ML or CL	A–4 or A–6.	100	75–90	0. 80–2. 50	0. 13–0. 17	4. 5–6. 0	High	Low to moderate.
Silt loam	ML or ML–CL.	A–4 or A–6.	100	90–100	0. 80–2. 50	0. 24–0. 30	4. 5–6. 0	High	Low to moderate.
Silt loam	ML	A–4	100	90–100	0. 80–2. 50	0. 24–0. 30	4. 5–5. 5	High	Low.
Silty clay loam or silt loam.	ML or ML–CL.	A–6	100	90–100	0. 80–2. 50	0. 24–0. 28	4. 5–5. 5	Moderate	Moderate.
Silt loam	ML–CL	A–4 or A–6.	100	90–100	0. 00–0. 05		4. 5–5. 5	High	Low to moderate.
Silt loam	ML–CL	A–4 or A–6.	100	90–100	0. 80–2. 50	0. 24–0. 30	4. 5–5. 5	High	Low to moderate.
Silt loam	ML	A–4	100	90–100	0. 80–2. 50	0. 24–0. 30	4. 5–5. 5	High	Low.
Silt loam	ML or ML–CL.	A–4 or A–6.	100	90–100	0. 80–2. 50	0. 24–0. 28	4. 5–5. 5	Moderate	Low to moderate.
Silt loam to silty clay loam.	ML–CL or CL.	A–4 or A–6.	100	90–100	0. 00–0. 05		4. 5–5. 5	High	Low to moderate.
Silt loam	ML–CL	A–4 or A–6.	100	90–100	0. 80–2. 50	0. 24–0. 30	4. 5–7. 3	High	Low to moderate.

TABLE 5.—*Brief descriptions of the soils and their*

Symbol on map	Soil name	Description of soil and site	Depth from surface
			Inches
LgA	Loring-Grenada silt loams, 0 to 2 percent slopes.[1]	For estimated properties of Loring-Grenada silt loams, see Grenada silt loam, 5 to 8 percent slopes.	
LgB	Loring-Grenada silt loams, 2 to 5 percent slopes.		
LgB2	Loring-Grenada silt loams, 2 to 5 percent slopes, eroded.[1]		
LgB3	Loring-Grenada silt loams, 2 to 5 percent slopes, severely eroded.[1]		
Ma	Made land.[2]	Consists of clayey material placed along Coldwater River when it was canalized; poorly drained on slopes of 8 to 12 percent.	
MeB2	Memphis silt loam, 2 to 5 percent slopes, eroded.	Well-drained silt loam about ½ to 1½ feet thick, over 1½ to 2½ feet of silty clay loam, underlain by silt loam; seasonally high water table below 4 feet.	0–13
MeB3	Memphis silt loam, 2 to 5 percent slopes, severely eroded.		13–31
MeC2	Memphis silt loam, 5 to 8 percent slopes, eroded.		31–60
MeC3	Memphis silt loam, 5 to 8 percent slopes, severely eroded.		
MeD2	Memphis silt loam, 8 to 12 percent slopes, eroded.		
MeD3	Memphis silt loam, 8 to 12 percent slopes, severely eroded.		
MeE2	Memphis silt loam, 12 to 17 percent slopes, eroded.		
MeE3	Memphis silt loam, 12 to 17 percent slopes, severely eroded.		
MeF	Memphis silt loam, 17 to 45 percent slopes.		
MeF3	Memphis silt loam, 17 to 45 percent slopes, severely eroded.		
Mg	Memphis-Gullied land complex.[2]	Moderately well drained and well drained upland soils that are very severely gullied; deep gullies at frequent intervals. Fingers of soil between gullies are Grenada or Memphis.	
NmE	Natchez-Memphis silt loams, 12 to 17 percent slopes.[1]	Well-drained soils of the loess bluffs; silt loam to a depth of about 10 to 30 feet; high water table below 6 feet; in places on ridgetops layer of silty clay loam occurs below depth of about 1 foot.	0–8 8–26
NmF	Natchez-Memphis silt loams, 17 to 50 percent slopes.[1]		26–65
PoD3	Providence silt loam, 8 to 12 percent slopes, severely eroded.	Moderately well drained soils; about ½ to 1½ feet of silt loam, over 1 to 2 feet of silty clay loam; fragipan 1 to 3 feet thick, underlain by sandy loam; seasonally high water table below 4 feet.	0–18 18–27
PrE	Providence-Ruston complex, 12 to 17 percent slopes (Providence part).[3]		27–55
PrE3	Providence-Ruston complex, 12 to 17 percent slopes, severely eroded (Providence part).[3]		55–70
RpF	Ruston-Providence complex, 17 to 50 percent slopes (Ruston part).[4]	About 1 foot of friable sandy loam, over 2½ feet of sandy clay loam or heavy loam, underlain by friable sandy loam to loamy sand.	0–9
			9–48
			48–66
Sm	Smoothed silty land.[2]	Consists of land that has been reclaimed from gullies by smoothing; most of the original soil material was of the Memphis series.	
Wk	Wakeland silt loam.	Somewhat poorly drained silt loam alluvium; seasonally high water table at depth of ½ to 1½ feet.	0–45
Wv	Waverly silt loam.	Poorly drained silt loam alluvium more than 4 feet thick; some areas stratified with silty clay loam at lower depths; seasonally high water table near surface.	0–20
			20–30 30–48

[1] Estimated properties for both soils are essentially the same. [2] Properties are too variable to be estimated.

estimated physical and chemical properties—Continued

Classification			Percentage passing sieve—		Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
USDA texture	Unified	AASHO	No. 10	No. 200					
					Inches per hour	*Inches per inch of soil*	*pH value*		
Silt loam	ML or ML–CL.	A–4	100	90–100	0.80–2.50	0.24–0.30	4.5–5.5	High	Low to moderate.
Silty clay loam	ML–CL or CL.	A–4 or A–6.	100	90–100	0.80–2.50	0.24–0.28	4.5–5.5	Moderate	Low to moderate.
Silt loam	ML–CL	A–4 or A–6.	100	90–100	0.80–2.50	0.24–0.30	4.5–5.5	High	Low to moderate.
Silt loam	ML	A–4	100	90–100	0.80–2.50	0.24–0.30	4.5–5.1	High	Low.
Silt loam	ML–CL or CL.	A–4 or A–6.	100	90–100	0.80–2.50	0.24–0.30	4.5–6.6	High	Low to moderate.
Silty clay loam	ML or CL	A–4 or A–6.	100	90–100	0.80–2.50	0.24–0.30	6.6–8.4	High	Low to moderate.
Silt loam	ML	A–4	100	90–100	0.80–2.50	0.24–0.30	4.5–5.5	High	Low.
Silty clay loam	CL or ML–CL.	A–4 or A–6.	100	90–100	0.80–2.50	0.24–0.28	4.5–5.5	Moderate	Low to moderate.
Sandy loam	ML	A–4	100	50–70	0.00–0.05	------------	4.5–5.5	High to moderate.	Low.
Sandy loam	SM	A–4	100	45–50	0.80–2.50	0.12–0.16	4.5–5.5	High	Low.
Fine sandy loam.	SM or ML	A–4	100	45–55	0.80–2.50	0.13–0.17	4.5–5.5	High	Low.
Sandy clay loam	SC	A–6 to A–7.	100	35–50	0.80–2.50	0.14–0.18	4.5–5.5	Moderate	Moderate.
Sandy loam	SM–SC	A–2 to A–4.	100	30–40	2.50–5.00	0.11–0.15	4.5–5.5	High	Low.
Silt loam	ML	A–4	100	90–100	0.80–2.50	0.24–0.30	6.1–8.4	High	Low.
Silt loam	ML or ML–CL.	A–4	100	90–100	0.80–2.50	0.24–0.30	4.5–6.1	High	Low to moderate.
Silty clay loam	CL	A–6	100	90–100	0.80–2.50	0.24–0.28	4.5–6.1	Moderate	Moderate.
Silt loam	ML or ML–CL.	A–4 or A–6.	100	90–100	0.80–2.50	0.24–0.30	4.5–6.1	High	Low to moderate.

[3] For Ruston part, see Ruston-Providence complex, 17 to 50 percent slopes.

[4] For Providence part, see Providence silt loam, 8 to 12 percent slopes, severely eroded.

TABLE 6.—*Interpretation of*

Soil series and map symbol [1]	Suitability as source of—		Soil features affecting engineering practices		
	Topsoil	Road fill	Highway location	Dikes or levees	Farm ponds: Reservoir area
Adler (Aa). Adler and Morganfield [2] (Ag, Am).	Fair to good.	Fair; easily eroded.	On flood plains and subject to occasional flooding; soil properties fair.	Low to fair stability; low shrink-swell potential.	Floods; slow seepage rate.
Alligator (Ao, Ar). Alligator-Dowling [2] (As).	Poor	Poor	Low position; high shrink-swell potential.	High shrink-swell potential.	Impervious; will support deep water.
Arkabutla (Au).	Fair to good.	Fair; easily eroded.	On flood plains and subject to occasional to frequent flooding.	Low to fair stability; moderate shrink-swell potential.	Slow seepage rate
Calloway (CaA, CaB, CaB2).	Poor to fair.	Fair; easily eroded.	High water table; fragipan impedes internal drainage; nearly level to gently sloping.	Low to fair stability and shear strength; low to moderate shrink-swell potential.	Slow seepage rate
Collins (Cm, Co).	Good	Fair; easily eroded.	On flood plain and subject to flooding.	Low to fair stability; low shrink-swell potential.	Slow seepage rate
Dowling (Dc).	Poor	Poor	Low position; high shrink-swell potential.	High shrink-swell potential.	Impervious; will support deep water.
Dundee (DnA, DsA).	Good to fair.	Good	On old natural levees of slightly higher elevation than surrounding terrain.	Fair to good shear strength and stability; moderate permeability.	Moderate permeability; deep pits generally hold moderate amount of water.
Falaya (Fa).	Fair to good.	Fair; easily eroded.	On flood plains and subject to occasional to frequent flooding.	Low to fair stability; low to moderate shrink-swell potential.	Slow seepage rate
Grenada (GrC, GrC2, GrC3, GrD, GrD2, GrD3).	Fair to poor.	Fair; easily eroded.	Level to strong slopes; fragipan impedes internal drainage; erodes easily.	Poor to fair stability; low to moderate shrink-swell potential.	Slow seepage rate
Henry (He).	Poor	Fair; easily eroded.	In low, flat to depressional areas; high water table.	Poor to fair stability; low to moderate shrink-swell potential.	Slow seepage rate
Loring-Grenada [2] (LgA, LgB, LgB2, LgB3).	Fair to poor.	Fair; easily eroded.	Level to strong slopes; fragipan impedes internal drainage; erodes easily.	Poor to fair stability; low to moderate shrink-swell potential.	Slow seepage rate
Memphis (MeB2, MeB3, MeC2, MeC3, MeD2, MeD3, MeE2, MeE3, MeF, MeF3).	Fair to good.	Fair; easily eroded.	Slopes easily eroded; level to steep; soil properties favorable.	Low to moderate shrink-swell potential; moderate stability.	Slow seepage rate
Morganfield [3] (Ag, Am).					
Natches-Memphis [2] (NmE, NmF).	Good	Fair; easily eroded.	Moderately to very steeply sloping.	Low to fair stability; moderate permeability.	Slow seepage rate

See footnotes at end of table.

engineering properties of soils

Soil features affecting engineering practices—Continued					Limitations for septic tank disposal fields
Farm ponds—Con. Embankment	Agricultural drainage	Irrigation	Terraces and diversions	Waterways	
Fair strength and stability.	Surface drainage needed.	High available water capacity; slow intake rate.	Soil properties favorable.	High available water capacity; moderate fertility; grows good sod.	Severe because of excessive flooding.
Very slow permeability; cracks when dry.	Surface drainage needed.	Cracks easily; high initial intake rate, which decreases as soil becomes moist.	Not needed	Low, nearly level position; clay texture; grows good sod.	Very severe; very slow permeability.
Low to fair strength and stability; slow seepage rate.	Surface drainage needed.	Slow intake rate; high available water capacity.	Soil properties favorable.	High available water capacity; grows good sod.	Very severe because of frequent flooding.
Low to fair strength and stability.	Surface drainage needed.	Slow intake rate; low to moderate available water capacity.	Soil properties favorable.	Moderately deep to shallow root zone; sod difficult to establish in pan zone.	Very severe because of fragipan.
Low to fair stability; low shrink-swell potential.	Surface drainage needed.	Slow intake rate; high available water capacity.	Soil properties favorable.	High available water capacity; grows good sod.	Severe because of flooding.
Very slow permeability; cracks when dry.	Surface drainage needed.	Cracks easily; high initial intake rate, which decreases as soil becomes moist.	Not needed	Low, nearly level position; clay texture; grows good sod.	Very severe; very slow permeability.
Moderate permeability; fair to good strength and stability.	Surface drainage needed.	Moderate intake rate; moderate permeability.	Not needed	High natural fertility; grows good sod.	Moderate; moderate permeability.
Low to fair strength and stability; slow seepage rate.	Surface drainage needed.	Slow intake rate; high available water capacity.	Soil properties favorable.	High available water capacity; grows good sod.	Very severe because of a high water table.
Poor to fair stability; low to moderate shrink-swell potential.	Surface drainage needed on nearly level areas.	Moderate available water capacity; slow intake rate.	Soil properties favorable.	Moderate available water capacity; grows good sod except in pan zone.	Moderate; fragipan impedes internal drainage.
Poor to fair stability; low to moderate shrink-swell potential.	Surface and subsurface drainage needed.	Slow intake rate; low available water capacity.	Soil properties favorable.	Sod sometimes difficult to establish in pan zone; low available water capacity.	Very severe because of high water table.
Poor to fair stability; low to moderate shrink-swell potential.	Surface drainage needed on nearly level slopes.	Moderate available water capacity; slow intake rate.	Soil properties favorable.	Moderate available water capacity; grows good sod except in pan zone.	Moderate; fragipan impedes internal drainage.
Low to fair strength and stability.	Surface drainage needed on nearly level areas.	High available water capacity; slow intake rate.	Soil properties favorable on gentle to moderate slopes.	High available water capacity; grows good sod.	Moderate on slopes of less than 10 percent.
Low to fair strength and stability; slow seepage rate.	Not needed	Slow intake rate; high available water capacity.	Soil properties favorable on milder slopes.	High available water capacity; moderate fertility; grows good sod.	Slight on slopes under 10 percent.

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TABLE 6.—*Interpretation of engineering*

Soil series and map symbol [1]	Suitability as source of—		Soil features affecting engineering practices		
	Topsoil	Road fill	Highway location	Dikes or levees	Farm ponds: Reservoir area
Providence (PoD3).	Fair to good except in fragipan.	Good	Fragipan impedes internal drainage; moderately sloping.	Fair stability; low to moderate shrink-swell potential.	Excessive seepage in some areas below pan.
Providence-Ruston (PrE, PrE3). Ruston-Providence (RpF).	Good	Good	Steep to very steep; soil properties favorable.	Good stability; moderate permeability.	Excessive seepage in some areas.
Wakeland (Wk).	Good	Fair; easily eroded.	On stream flood plains and subject to occasional flooding.	Low to fair stability; moderate permeability.	Fair to moderate seepage.
Waverly (Wv).	Fair to good.	Fair; easily eroded.	On flood plains and subject to occasional to frequent flooding.	Low to fair stability; moderate shrink-swell potential.	Slow seepage rate

[1] Most soil complexes and all miscellaneous land types are not listed. Interpretations of the soil series in complexes can be determined by referring to the soils in the complex; miscellaneous land types are too variable for interpretations to be made.

moisture content of very dry clay soil increases, the soil changes from a semisolid to a plastic state. As moisture content is further increased, the soil changes from the plastic state to a liquid state. The plastic limit is the moisture content at which the soil changes from a semisolid to the plastic state. The liquid limit is the moisture content at which the soil changes from a plastic to a liquid state. The numerical difference between the plastic limit and the liquid limit is known as the plasticity index.

As the moisture content is increased in a soil being compacted by a constant effort, density of the soil will increase until the optimum moisture content is reached. If additional moisture is added, the density of the compacted soil will decrease. The highest dry density that can be obtained in compaction tests is termed "maximum dry density." The moisture-density relationship is important in earthwork because optimum stability is obtained when a soil is compacted to its maximum density at optimum moisture content.

In table 5, in the column headed "Permeability," is the estimated rate at which water moves downward in undisturbed soil. The estimates are based on structure and porosity of the soils and on permeability tests made on undisturbed cores from soils similar to those in this county.

The available water capacity, reported in inches per inch of soil depth, is the approximate amount of water that the soil can hold in a form available to plants. It is the difference between the amount of water in the soil at field capacity (approximately 1/3 atmosphere for silty and clayey soils and 1/10 atmosphere for sandy soils) and the amount at the time plants wilt (approximately 15 atmospheres of tension).

The shrink-swell potential is an indication of the volume change to be expected with a change in moisture content. This potential is based on volume-change tests or on observations of other physical properties or characteristics of the soil. In general, soils classified as CH and A-7 have a high shrink-swell potential. Clean sands and gravel (single grain, or structureless), soils containing small amounts of nonplastic to slightly plastic fines, and most other nonplastic to slightly plastic soil material have a low shrink-swell potential. For example, the Alligator soils, which are high in montmorillonite clay, are very sticky when wet and develop extensive shrinkage cracks when dry; hence, these soils have a very high shrink-swell potential. On the other hand, the subsoil of Collins silt loam is structureless and nonplastic; hence, it has a low shrink-swell potential.

In table 6 the soils of the county are rated according to their suitability as a source of topsoil and road fill, and the properties of the soils that affect their use for highways, ponds, drainage systems, and similar structures are pointed out.

The suitability of the soils as a source of sand has not been rated in table 6, as all are unsuitable except the Dundee, Providence, and Ruston. The Dundee and Providence soils, however, are a poor source of sand. The Ruston soils have underlying material in some areas that is a good source of sand. The sand is suitable for use as aggregate for concrete.

Also, none of the soils except the Memphis and Natchez are a suitable source of gravel. Local areas of these soils are underlain by gravel suitable for road surfacing and as aggregate for concrete.

Engineering practices

This general discussion of engineering practices and related soil properties serves to summarize and supplement information given in tables 5 and 6. First, the behavior of soils as material for highways and foundations is considered, and then their performance in ponds, terraces, and similar conservation structures.

properties of soils—Continued

Soil features affecting engineering practices—Continued					Limitations for septic tank disposal fields
Farm ponds—Con.	Agricultural drainage	Irrigation	Terraces and diversions	Waterways	
Embankment					
Fair to good strength and stability.	Not needed	Slow intake rate; moderate available water capacity.	Soil properties favorable.	High water table; erodible.	Moderate to severe because of fragipan and degree of slope.
Fair to good strength and stability.	Not needed	Moderate intake rate; moderate permeability; moderate available water capacity.	Soil properties favorable on moderate slopes.	Low natural fertility; moderate available water capacity; grows good sod when fertilized.	Moderate to severe because of slope and fragipan in some areas.
Low to fair strength and stability; slow seepage rate.	Surface drainage needed.	Slow intake rate; high available water capacity.	Soil properties favorable.	High water holding capacity; grows good sod.	Severe because of a high water table.
Low to fair strength and stability; slow seepage rate.	Surface drainage needed.	Slow intake rate; high available water capacity.	Soil properties favorable.	High available water capacity; grows good sod.	Very severe because of frequent flooding.

[2] Interpretations for soils of these two series are essentially the same.

[3] See Adler and Morganfield.

HIGHWAY AND FOUNDATION WORK

Undesirable physical and chemical properties and poor drainage are the principal soil problems in highway engineering.

When engineering works are planned and designed, the water table definitely should be considered. Building foundations and highways should have adequate drainage facilities when constructed on soils of the Alligator, Dundee, Dowling, Adler, Calloway, Grenada, Loring, Henry, Morganfield, Collins, Falaya, Waverly, Wakeland, and Providence series. The surface drainage problem usually can be overcome in highway construction by raising the roadbed through areas where these soils exist. The Providence, Calloway, Grenada, Loring, and Henry series have a fragipan, or compacted stratum of silt and finer materials at a depth of 10 to 31 inches, which impedes the movement of water through the soils and is a problem in designing engineering works.

The shrink-swell potential of the soils has a direct relation to engineering works. Volume changes caused by shrinking and swelling, as moisture content varies, are problems in designing foundations of buildings and roadbeds in areas where wide variations in moisture occur. Swelling pressure for some clays reaches 10 tons per square foot. Fills consisting of clayey material should be placed when the soil is wet and should be compacted lightly; however, settlement and strength requirements need to be considered in designing engineering works. Since coarse-grained soils are least affected by moisture changes, the subgrade for highway pavements should be of coarse-grained material. This material should be placed across the entire roadbed to minimize breaking and cracking of the hard surfacing material. Ruston and Providence soils are satisfactory for subgrade material; however, the first 3 feet of the surface layer of the Providence soils must be removed in order to get to the acceptable material.

The Alligator and Dowling series have a substratum that has a high shrink-swell potential.

The shear strength of soils has an important relation to their stability on slopes and their bearing capacity for foundations. Except where there are excessive natural stresses (water pressure), the coarse-grained soils have sufficient shear strength for most uses. The Dundee, Ruston, and Providence soils are the best foundation materials available in the county for buildings, highways, and airports.

If sites for highways, airports, and buildings are planned for the Dundee soils, the flooding hazard should be considered.

Bedrock occurs at great depth and cannot be used as footing for foundations.

CONSERVATION WORK

This section tells how properties of soils affect their behavior when they are drained, irrigated, or used for ponds, terraces, diversion ditches, and other conservation structures.

Drainage.—Most of the bottom land in the county needs drainage. The main types used are (1) surface drainage of fields by V- and W-ditches and by row arrangement and (2) drainage by mains and laterals.

Many farm drainage systems have failed because of poor outlets. There are, however, many large streams in the county that provide adequate outlets for mains and laterals. There are also other streams, which, if improved would provide adequate outlets. Some of these streams are now being improved for this purpose, and plans are being made to improve others.

Mains and laterals: These are ditches that are usually constructed with a dragline and are trapezoidal in shape. The minimum-sized ditch is 2½ feet deep and is 3 feet wide at the bottom. Side slopes range from 1:1 on heavy plastic material to 3:1 on light silts and sands. In many cases these ditches will serve several farms.

V- and W-type ditches: These ditches are used where surface drainage is needed. They intercept water from rows and discharge it into mains or laterals.

The V-type ditch is so named because of its shape. It is constructed with side slopes no steeper than 4:1 and with capacity to remove 3 inches of runoff in 24 hours. This type ditch is easy to maintain and, because of its flat slopes, is easily accessible to farm equipment. The spoil should be spread next to the ditch in such a manner that runoff water can enter the ditch.

The W-type ditch is constructed by moving and shaping the spoil from two parallel V-ditches toward the center so as to form a ridge between the channels. This construction permits row drainage from both sides and tends to raise the elevation of the low area that is to be drained. This ridge can be cultivated or used as a field road.

Row arrangement: On nearly level land, row systems are needed to control erosion and to conserve moisture during dry periods, as well as to remove excessive runoff during wet seasons. Rows are established on a controlled grade and are so arranged that farm machinery can be readily used. On bottom land the runoff from rows discharges into surface field ditches. The spacing of these ditches is designed to keep the rows short enough to handle the runoff without overtopping.

On steeper slopes where terraces are not used, rows are paralleled to a "key" line that has been established on a controlled grade. Runoff from rows drains from ridge to draw and drains into a vegetated waterway (fig. 15). "Key" rows should be run at 0.3 percent grade on light soils and 0.4 percent grade on heavy soils. Land smoothing between the "key" rows permits better row alinement.

Irrigation.—The average annual rainfall for Tate County is 52.5 inches, which would be enough to grow all plants that are common to the county if it came at the right time. Supplementary irrigation would be profitable in some instances. Little sprinkler or furrow irrigation has been used, however, because of the high initial cost of a sprinkler system and of the land leveling needed for a furrow system. As better flood protection is provided and channels are realined to facilitate the use of mechanized farm equipment, irrigation will become economically sound.

***Figure 15.*—Runoff from cotton rows drains into waterway planted to fescue and white clover.**

Ponds.—Farm ponds have been used extensively for livestock water, fish production, and recreation. The principal ponds constructed are the (1) embankment, or levee type, and (2) the excavated, or dugout type. The first is constructed by placing a dam across a natural basin (fig. 16), and the second by digging a pit in impervious soils. Side slopes for pond embankments should be 2:1 for clayey gravels (GC), clayey sand (SC), and silty sands (SM); 2½:1 for sandy or silty clays (CL), and clayey fine sands (ML); and 3:1 for plastic clays (CH), and clayey silts (MH). The material used in foundations for embankments should have enough bearing strength to support the levee with minimum consolidation and should be impervious enough to prevent excessive seepage.

Sites should be selected where ponds that hold a dependable supply of water can be built. A minimum depth of 6 feet for one-fifth of the surface area of a levee pond and for one-fourth of the surface area of a dugout pond is desirable. There should be at least 5 acres in the watershed for each acre in the surface of the pond. Up to 100 cubic feet of water per second can be disposed of by vegetated spillways, but an auxiliary spillway should be used to dispose of the flow in excess of 100 cubic feet per second. Generally 60 acres is the maximum area that is drained principally by a vegetated spillway.

Terraces.—A terrace consists of a ridge with a channel on the upper side. It is constructed across the slope at a designed grade and spacing. Terraces collect and transport runoff water to protected outlets at noneroding velocities. The "Copeland System" has been widely used to construct terraces in Tate County. In this system, the terraces follow closely to the contour of the land, and the fields are thus broken into many irregular shapes and form crooked rows. Because of the use of highly mechanized farm equipment, this type of terrace has been practically discontinued. Consequently, a different layout is now used, and terraces are made parallel when possible by using a variable grade, land smoothing, cutting and filling between terraces, and multiple outlets. The parallel terraces keep irregularly shaped areas in the field to a minimum. The grade of the terrace and size of the channel must be great enough to remove runoff from a 10-year frequency rainfall at noneroding velocities.

The grade of the upper 200 feet of a terrace should not exceed 1.5 percent. The grade of the rest of the terrace may be variable, but the average should not exceed 0.5 percent. On heavy, nonerodible soils, however, a grade of 1 percent may be used for distances up to 100 feet. Terraces are ineffective on deep sands and on stony, steep, or shallow soils.

Diversions.—Diversions are waterways used to intercept runoff and carry the excess water to protected outlets. They consist of a ridge with a channel on the upper side and are constructed across the slope at a controlled grade. The design should be such that runoff from a 10-year-frequency rainfall can be intercepted and transported to

Figure 16.—This dam across a natural basin provides water for many purposes and retards floodwater.

protected outlets at noneroding velocities. These velocities should not exceed 3 cubic feet per second for lighter soils (SM, SC, CL, ML) and 4 cubic feet per second for heavy soils (MH, CH, OH).

Diversions are generally located at the foot of slopes (1) to intercept from steeper slopes the runoff that causes damage to cropped areas, pastures, terraces, and row-arrangement systems, or (2) to transport water to other areas for beneficial use.

SEWAGE-DISPOSAL SYSTEMS

Because of the widespread use of electricity in the county, rural homes are being rapidly modernized. Also, many rural residential areas are being developed along Interstate Highway No. 55. The construction of sewage-disposal systems in rural areas is therefore of prime importance. Some of the soil features affecting these systems are discussed in this subsection.

Domestic sewage-disposal fields.—The absorptive rate of the soil, the ground-water level, the depth to rock, sand, or gravel, the slope, the flooding hazard, and the closeness to streams are important in the planning and design of sewage-disposal fields.

The absorptive capacity of the soils is of utmost importance. The outflow from the septic tank must be absorbed and filtered by the soil to remove odors and to prevent the contamination of ground water and the concentration of unfiltered sewage at the surface. If topographic and geologic factors are favorable, soils having a percolation rate of one inch or more per hour have slight limitations and generally are suitable for sewage-disposal fields. The soils classified as GC, SM, SC, ML, CL, OL, and MH are usually suitable for these fields in their undisturbed state; however, on-site percolation tests should be run. The soils classified as CH and OH have severe limitations and generally are not satisfactory for sewage-disposal fields.

Filter fields do not function properly on soils that have a high water table or a fragipan layer, or those that are

subjected to flooding from nearby streams. The Alligator, Dundee, Dowling, Adler, Morganfield, Collins, and Waverly series are subject to flooding. The Calloway, Falaya, Grenada, Loring, Henry, Providence, and Wakeland series have a seasonally high water table or a fragipan layer.

Filter fields can be established satisfactorily on slopes as steep as 10 percent, provided the soils are favorable and trenches are constructed on the contour. On the steeper slopes, trench filter fields are more difficult to lay out and construct and effluent may reach the surface before the filtering action is complete.

In Tate County bedrock is too deep to be a problem in the construction of filter fields.

Low-berm sewage lagoons.—Many municipalities in this area are using lagoons for disposal of sewage. The evaporation and seepage losses from the lagoon must not exceed the inflow of effluent. The permeability and stability of the levee constructed are important. Care should be taken to prevent seepage in the foundation under the levee.

Soils that have good stability and are not too permeable—those classified as SM and SC—are the most desirable for levees. The soils classified as ML, CL, CH, and MH are satisfactory but soil properties are improved when used in combination with those classified as SM and SC. Used alone, they are unstable and are subject to severe erosion. Although impervious cores are desirable, they are not generally needed in an embankment in this county.

Reservoir or sewage lagoon site.—It is desirable to locate an unlined sewage lagoon in soils that are impervious. Where the soils classified as SC, CL, and CH occur in uniform deposits or in combination with each other, they are impervious enough to prevent excess seepage. Soils with silt components—those classified as ML or SM—are common in this area and make less desirable bottoms for ponds. They may be used for this purpose, however, if they are mixed with semipermeable material from other soils in the county.

Formation and Classification of Soils

In this section are discussed the factors that affect the formation of soils, the processes of soil formation, and the classification of the soils into higher categories. Following this, the great soil groups are defined, and a soil profile that is typical of each series in Tate County is described.

Factors of Soil Formation

The characteristics of the soil at any given point on the earth are determined by the nature of the parent material, climate, living organisms, relief, and time. All of these factors affect the formation of every soil. The relative importance of each differs from place to place. In extreme cases, one factor may dominate in the formation of the soil and fix most of its properties, as is common when the parent material consists of pure quartz sand. Little can happen to quartz sand, and the soils derived from it usually have faint horizons. Even in quartz sand, however, distinct profiles can be formed under certain types of vegetation where the topography is low and nearly level and the water table is high.

The five soil-forming factors are interdependent; each modifies the effects of the others. Climate and living organisms are the active factors of soil formation. They act on parent material and gradually change it into a natural body that has genetically related horizons. Relief largely controls runoff and therefore influences the effectiveness of climate and vegetation. Finally, time is needed to change parent material into a soil. The time needed for horizon differentiation may be much or little, but some time is always required. In most places a long time is required for the development of distinct horizons.

Parent material

Water from the Gulf of Mexico covered the valley of the Mississippi River as far north as Cairo, Ill., during the late Mesozoic and early Cenozoic eras of geologic time. The entire State of Mississippi, except small areas in Tishomingo County, was covered by water. Streams emptying into the gulf deposited layers of unconsolidated sand, clay, and silt.

After the water receded from the area that is now Tate County, marine deposits were exposed, and during the Pleistocene age layers of windblown silty material were deposited. This material is commonly called loess. Studies of all relationships tend to show that the loess is largely glacial rock flour that was carried southward and deposited by streams flowing from the melting ice. After the water receded, the dry rock flour was picked up by the wind from the flood plains of these streams and redeposited in an area extending from the flood plain of the Mississippi River to the top of the east wall of the river valley (*14*). This band of loess originally covered the entire upland areas of the county. The deepest loess is in the more rugged area paralleling the bluffs along the Mississippi Alluvial Plain.

Geologic erosion has removed much of the loess from the stronger slopes. In the eastern part of the county where the loess was originally thinner, only a cap of loess remains on some ridges, and Coastal Plain deposits are exposed on steep side slopes. The overlapping of the loess deposits on Coastal Plain deposits results in the formation of polygenetic soil profiles, or profiles having many sources, in some parts of the county. Where the overlying loess is shallow, the upper soil horizons have developed from weathered loess, and the lower horizons have developed from Coastal Plain material.

In places along the bluffs, some of the original calcareous loess occurs at various depths in the unweathered part of the profile. Unweathered loess is noted for the uniformity of its physical and chemical composition. Other distinctive characteristics are the fine texture and irregular shape of its particles, its lack of coherence, and its ability to stand in almost vertical walls.

Another kind of parent material from which the soils of Tate County developed is alluvium. The soils on the Delta have formed in alluvium deposited by the Mississippi River. There has been no appreciable amount deposited, however, since levees were constructed (before 1859). The smaller streams and their tributaries throughout the county have deposited alluvium on their flood plains. From this alluvium, some of the best soils in Tate County have formed. Most of these areas still receive fresh deposits during each flood.

Climate

The climate of Tate County is of the humid, warm-temperature, continental type. It is characterized by rather warm summers and mild winters. The average temperature and normal rainfall distribution for the county are given in table 8, page 81.

The warm, moist weather that prevails most of the year favors rapid chemical reactions. The relatively high precipitation leaches the bases and other soluble materials and promotes the translocation of colloidal matter and other less soluble materials. Climate is the direct or indirect cause of variations in the kinds of plant and animal life and of the major differences these variations have brought about in the development of soils. In the warm, humid climate of Tate County, the more mature soils have been highly leached and the geologically young soils are being leached. Because the soils are frozen for only short periods during winter, translocation and leaching proceed without interruption throughout most of the year.

Living organisms

The higher plants, micro-organisms, earthworms, and other forms that live on or in the soil are determined by the climate and many other factors. Living organisms are indispensable in soil development.

The organic matter that accumulates in the upper part of the soil from the decay of leaves and other parts of plants is changed into other chemical compounds by living organisms. The organic acids released by decomposition of the organic matter dissolve the slowly soluble mineral constituents and hasten the leaching and translocation of these inorganic materials. Climate also affects the kinds and amounts of vegetation and micro-organisms and the rate of chemical action and of leaching.

The native vegetation of the Mississippi Alluvial Plain ranges from thick stands of large, deciduous trees with a heavy undergrowth of vines and cane to fresh-water swamp vegetation consisting mainly of cypress and tupelo-gum with very little undergrowth. In some of the soils, the aerobic conditions are practically ideal for vigorous biological activity that rapidly reduces organic matter. In other soils, however, anaerobic conditions predominate, and the organic matter decomposes slowly.

The native vegetation on the uplands of Tate County consisted of hardwoods of the oak-hickory forest type. The flood plains of the smaller streams of the county were covered primarily with oak, gum, and beech trees and a fairly heavy undergrowth of vines and cane. The organic matter has been rapidly reduced by aerobic organisms in most soils in the hilly part of the county.

The forest cover and the warm humid climate have greatly contributed to the light color and small amount of organic matter in the soils. In undisturbed areas the surface ½ to 1 inch in the more mature soils is generally dark and contains a large quantity of partly decayed leaves, twigs, and bark. Elsewhere, however, the environment does not allow the accumulation of large quantities of organic matter. Exceptions are soils of the Alligator and Dowling series, which contain a moderate amount of organic matter and are dark colored.

A vast number of organisms live in the soils of the county. Most of these organisms are plants, but the effects of small animals should not be minimized. The small animals include springtails, millipedes, sowbugs, mites, earthworms, nematodes, protozoa, rotifers, and many others. Among the plants in the soil are algae, fungi, actinomyces, and bacteria. The roots of higher plants also affect the soil.

The existence of these soil organisms depends on the soil conditions, particularly the food supply. The number of organisms constantly fluctuates because of multiplication and because of death, which is frequently caused by starvation. The total weight of living matter, including plant roots, in an acre of soil to plow layer depth is at least 5,000 pounds and in some soils is more than 10,000 pounds. Nearly all natural soil reactions are directly or indirectly biochemical.

Relief

Soils of Tate County range from nearly level to very steep. The relief modifies the effects of climate and vegetation.

On some steep soils, runoff is so great that geologic erosion keeps an almost even pace with soil formation. Consequently, soil materials do not remain in place long enough to allow the formation of a profile that has distinct, genetically related horizons. On these steep slopes, the quantity of water that percolates through the soil and the quantity of material leached and washed down are small.

In nearly level areas and depressions where the water table is high, the soils are likely to be wet and gray. A fragipan forms in many of the soils on broad, nearly level slopes. As the steepness of the slope increases, the thickness of the fragipan usually decreases. A pan seldom occurs in soils that have slopes of more than 12 percent.

Time

Time is required for the development of soil from the parent material. The length of time required depends on the other factors involved. If the factors of soil formation have not operated long enough to form a soil that is nearly in equilibrium with the environment, the soil is considered young or immature.

The soils on the bottom lands are the youngest and do not have distinctly developed profile characteristics. Erosion regularly occurs on soils in the uplands, and the bottom lands receive fresh deposits of sediment frequently.

The soils in the uplands are the oldest and best developed or contain horizons that are most clearly expressed in the county. These soils have developed characteristic properties and are essentially in equilibrium with their environment. Soils on the steeper slopes, however, where geologic erosion is rapid, have a thinner solum and are otherwise less well developed than soils on the more gentle slopes.

Processes of Soil Formation

Because of the wide range in parent material, relief, age, and biological activity, the soil-forming processes of Tate County are complex. The soils of the county have changed greatly since the geologic ages thousands of years ago, when glacial rock flour was being deposited on much of this area by the westerly winds. The soil-forming processes have produced the soils as we now know them and are still very active. They have been working much longer on soils of the uplands than on soils of the flood plains. Consequently, the soils of the uplands are older and have

stronger profile development than soils of the bottom lands.

The differences in the horizons of the soils in the county are caused by one or more processes. The main processes are (1) the accumulation of organic matter, (2) the leaching of carbonates and salts, (3) the formation and translocation of silicate clay minerals, and (4) the reduction and transfer of iron.

Organic matter has accumulated in the top layer of the soils in the county to form A horizons. A large amount of this organic matter is well decomposed material, or humus, but a considerable amount consists of living plants and other organisms.

Carbonates and salts have been leached from most soils in the county. They have been leached, however, only from the upper horizons of a few soils in the bluff area. Also, all soils except those in the bluff area are acid, and their colloidal complexes are predominantly saturated with hydrogen ions.

The formation and translocation of silicate clay minerals, or eluviation, have affected all the soils in the county except the alluvial soils. Because alluvial soils are young, the processes that cause the formation and translocation of silicate clay minerals have not acted on them long enough to cause significant differences among the layers. The A horizon of soils in the uplands in the county are eluviated and contain a small amount of clay. The illuviated B horizons contain an accumulation of clay. The results of eluviation, or downward movement of clay, can be identified as clay films on ped faces and on the walls of root channels and wormholes or other holes. Some soils in the county have more than one sequum, that is, more than one eluvial horizon and its related illuvial horizon.

The reduction and transfer of iron have occurred in the poorly drained and somewhat poorly drained soils and to some extent in the lower part of the moderately well drained soils. This process is called gleying. It is more likely to occur in soils in nearly level areas or in depressions than in those in sloping areas. In the nearly level or depressed areas, the restricted drainage results in reduced leaching, pronounced hydration, anaerobic biological activity, accumulation of organic acids, reduction of iron, and development of gray colors. Red, yellow, and brown colors generally occur in soils that are well oxidized. When the soil is not sufficiently aerated and oxidized, gleying occurs, and mottles and concretions of iron and manganese form.

Classification of the Soils

Soils are placed in narrow classes so that their behavior within farms or counties can be studied. They are placed in broad classes so that large areas can be studied and compared. In the comprehensive system of soil classification followed in the United States, the soils are placed in six categories (*10*). Beginning with the broadest, the six categories are the order, suborder, great soil group, family, series, and type.

In the broadest category the soils are grouped into three orders, whereas in the lowest category thousands of soil types are recognized. The suborder and family categories have never been fully developed and therefore have been little used. Attention has been given mainly to the classification of soils into soil types and series within counties or comparable areas and to the subsequent grouping of series into great soil groups and orders.

In table 7 the soil series in Tate County are listed according to order and great soil group, and some distinguishing characteristics are given. Described in the following pages are the orders, the great soil groups represented in the county, and the soil series in these great soil groups. A detailed description of the profile of a soil in each series follows the description of the series.

TABLE 7.—*Classification of the soil series by higher categories, and some of the factors that have contributed to differences in their formation*

ZONAL

Great soil group and soil series	Description of profile [1]	Position	Drainage	Slope	Parent material	Degree of profile development [2]
Gray-Brown Podzolic soils—				*Percent*		
Dundee	Grayish-brown to dark-brown very fine sandy loam to silty clay loam over mottled, grayish-brown loam to silty clay loam; acid.	Old natural levee.	Moderately good to somewhat poor.	0–2	Medium- and fine-textured alluvium from Mississippi River.	Medium.
Grenada	Brown to dark-brown silt loam over yellowish-brown to dark-brown silt loam; fragipan at a depth of 20 to 30 inches.	Upland	Moderately good.	0–12	Loess	Strong.
Loring	Dark grayish-brown to brown silt loam over brown to dark-brown silty clay loam; fragipan is below a depth of 30 inches.	Upland	Moderately good to good.	0–5	Loess	Strong.
Memphis	Dark grayish-brown to brown silt loam over brown to dark-brown silty clay loam; acid.	Upland	Good	2–45	Loess	Strong.
Natchez	Dark grayish-brown silt loam over yellowish-brown to brown silt loam; medium acid in upper part, alkaline in lower part.	Upland	Somewhat excessive.	12–45	Loess	Weak.

TABLE 7.—*Classification of the soil series by higher categories, and some of the factors that have contributed to differences in their formation*—Continued

ZONAL—Continued

Great soil group and soil series	Description of profile [1]	Position	Drainage	Slope	Parent material	Degree of profile development [2]
Red-Yellow Podzolic soils—						
Ruston	Very dark grayish-brown fine sandy loam over yellowish-red sandy clay loam; acid.	Upland	Good	12–50	Coastal Plain material.	Medium.
Providence	Dark grayish-brown to brown silt loam over brown to dark-brown heavy silt loam or silty clay loam; fragipan is at a depth of 20 to 30 inches; underlain by Coastal Plain material; acid.	Upland	Moderately good.	0–50	Loess over Coastal Plain material.	Strong.
INTRAZONAL						
Low-Humic Gley soils—						
Alligator	Dark-gray silty clay loam to plastic clay over gray plastic clay; acid.	Slack-water area.	Poor	0–2	Fine-textured alluvium from Mississippi River.	Weak.
Dowling	Dark-gray plastic clay over gray, heavy, plastic clay; acid.	Depression	Poor	0–2	Slack-water deposits from Mississippi River.	Weak.
Waverly	Dark-gray, mottled silt loam over gray silt loam; gray mottles within 6 inches of the surface; acid.	Bottom land	Poor	0–2	Alluvium from loess.	Weak.
Planosols—						
Calloway	Dark grayish-brown to brown silt loam over yellowish-brown heavy silt loam; fragipan at a depth of about 16 inches; acid.	Upland	Somewhat poor.	0–5	Loess	Strong.
Henry	Very dark grayish-brown silt loam over gray-and-brown mottled silt loam; fragipan is at a depth of about 12 inches; acid.	Upland	Poor	0–2	Loess	Very strong.
AZONAL						
Alluvial soils—						
Adler	Dark yellowish-brown, dark-brown, or yellowish-brown silt loam; gray mottles at depth between 18 and 30 inches; slightly acid to mildly alkaline.	Flood plain	Moderately good.	0–3	Alluvium from loess.	Weak.
Arkabutla	Brown silty clay loam over gray, mottled silty clay loam; gray mottles at depth between 6 and 18 inches; medium acid to strongly acid.	Flood plain	Somewhat poor.	0–2	Alluvium from loess.	Weak.
Collins	Dark-brown silt loam; gray mottles between 18 and 30 inches; medium acid to strongly acid.	Flood plain	Moderately good.	0–3	Alluvium from loess.	Weak.
Falaya	Brown silt loam over gray, mottled silt loam; gray mottles between 6 and 18 inches; medium acid to strongly acid.	Flood plain	Somewhat poor.	0–2	Alluvium from loess.	Weak.
Morganfield	Grayish-brown silt loam over brown, silty subsoil; gray mottles below 30 inches; slightly acid to mildly alkaline.	Flood plain	Good	0–3	Alluvium from loess.	Weak.
Wakeland	Brown silt loam over brown and gray, mottled silt loam; gray mottles between 6 and 18 inches; slightly acid to mildly alkaline.	Flood plain	Somewhat poor.	0–2	Alluvium from loess.	Weak.

[1] The descriptions are for profiles not materially affected by accelerated erosion.

[2] Determined by the number of genetic horizons and the degree of contrast between them.

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Soils of the zonal order

The zonal order consists of soils with evident, genetically related horizons that reflect the dominant influence of the active factors of soil genesis, climate, and living organisms, chiefly vegetation. The soils of the zonal order in Tate County are members of the Gray-Brown Podzolic and the Red-Yellow Podzolic great soil groups.

GRAY-BROWN PODZOLIC SOILS

Soils in the Gray-Brown Podzolic great soil group have a comparatively thin organic covering; a thin organic-mineral layer; a grayish-brown, leached layer; and an illuvial brownish B horizon. The soils developed under deciduous forest in a temperate moist climate. The surface covering is leaf litter from deciduous trees. The underlying dark, thin layer is slightly or moderately acid and consists of humus mixed with mineral soil. The brownish B horizon becomes lighter colored with increasing depth. The thickness of the solum varies widely, but it seldom exceeds 4 feet. Soils of this great soil group generally have medium natural fertility. In Tate County the Dundee, Grenada, Loring, Memphis, and Natchez soils are members of the Gray-Brown Podzolic great soil group.

DUNDEE SERIES: The Dundee series consists of moderately well drained and somewhat poorly drained, acid soils on the flood plains of the Mississippi River. They have slopes of 0 to 2 percent and are on natural levees or low terraces bordering former channels of the river. The Dundee soils were derived from thinly stratified layers of loamy and clayey alluvium deposited by the Mississippi River. They have a dark grayish-brown fine sandy loam to silty clay loam surface layer about 4 inches thick. The subsoil is grayish-brown, mottled loam or silty clay loam.

The Dundee soils are along the western edge of the county near the Coldwater River. They occur with the Alligator and Dowling soils, which are in the slack-water areas. These soils are finer textured and more plastic and have poorer drainage than the Dundee soils.

The natural vegetation consists of mixed hardwoods and vines. Most areas of these soils have been cleared and are used for row crops.

Profile of Dundee loam in a cultivated field, 1/4 mile south of the intersection of Mississippi State Highway No. 3 and the Coldwater River and 30 yards from the river; northwest corner of SW1/4SW1/4 sec. 23, T. 5 S., R. 10 W.

Ap—0 to 4 inches, dark grayish-brown (10YR 4/2) loam; weak, fine, granular structure; very friable; many fine roots; medium acid; abrupt, smooth boundary.

B21t—4 to 9 inches, dark-brown (10YR 3/3) loam; many, coarse, faint, grayish-brown (10YR 5/2) mottles; weak, medium, subangular blocky structure; firm (plowpan); few clay films on peds; few fine roots; medium acid; clear, wavy boundary.

B22t—9 to 19 inches, dark grayish-brown (10YR 4/2) loam; common, fine, faint, grayish-brown (10YR 5/2) and few, medium, distinct, dark yellowish-brown (10YR 4/4) mottles; moderate, medium, subangular blocky structure; friable to firm; plastic; slightly sticky; few clay films on ped faces; few small voids; few, fine, soft, brown concretions; few fine roots; medium acid; clear, wavy boundary.

B3g—19 to 26 inches, mottled dark grayish-brown (10YR 4/2), grayish-brown (10YR 5/2), brown (7.5YR 5/4), and dark-brown (7.5YR 4/4) loam; weak, fine to coarse, subangular blocky structure; friable; plastic; slightly sticky; some ped faces coated with gray silt; medium acid; gradual, wavy boundary.

Cg—26 to 48 inches, loam mottled gray to light gray (10YR 6/1) and brown (7.5YR 5/4) to dark brown (7.5YR 4/4); structureless; friable; medium acid.

Profile of Dundee silty clay loam in a cultivated field, 1/2 mile north of Sarah and 1/4 mile west of the Illinois Central Railroad; SE1/4SE1/4 sec. 11, T. 6 S., R. 10 W. The slope is 2 percent.

Ap—0 to 4 inches, dark grayish-brown (10YR 4/2) silty clay loam; weak, fine, granular structure; friable; plastic; slightly sticky; many fine roots; medium acid; abrupt, smooth boundary.

B2t—4 to 18 inches, brown (10YR 5/3) silty clay loam; few, fine, distinct, light brownish-gray (10YR 6/2) mottles; moderate, fine and medium, subangular blocky structure; firm; sticky; common clay films on ped faces; common fine roots; strongly acid; gradual, wavy boundary.

IIB3—18 to 30 inches, mottled brown (10YR 5/3) and light brownish-gray (10YR 6/2) loam; weak, medium and coarse, subangular blocky structure; firm; slightly sticky; strongly acid; gradual, wavy boundary.

IICg—30 to 50 inches +, mottled light brownish-gray (10YR 6/2) and dark yellowish-brown (10YR 4/4) loam; massive; firm; slightly sticky; few, small, soft, black concretions; few gray silt coatings in cracks; strongly acid.

The color of the Ap horizon ranges from dark grayish brown to brown. The depth to gray mottles ranges from 4 to 18 inches. The texture of the B2t horizon ranges from heavy loam to light silty clay. The thickness of the B2t horizon ranges from 10 to 15 inches. The texture of the IIC horizon ranges from silt loam to loamy sand but generally is loam. The Ap horizon ranges from slightly acid to strongly acid and the B and IIC horizons from slightly acid to very strongly acid.

GRENADA SERIES: The Grenada series consists of moderately well drained, acid soils in the uplands. These soils are on narrow to broad ridges that have slopes as much as 12 percent and have developed in thick deposits of loess. They have a brown to dark-brown silt loam surface layer and a brown to dark yellowish-brown heavy silt loam subsoil. A fragipan is at a depth of about 24 inches.

The Grenada soils are the predominant soils in the uplands of Tate County. They are scattered throughout the hilly section but are mostly in the eastern half of the county. They occur with Memphis, Loring, Calloway, and Henry soils. The Grenada soils have better drainage than the Calloway and Henry soils and poorer drainage than the Memphis and Loring.

The natural vegetation consists of mixed hardwoods and an understory of shade-tolerant trees, low shrubs, vines, and a sparse stand of grasses.

Profile of Grenada silt loam, severely eroded, in a pasture 3 3/4 miles south of Independence in a road cut on the west side of Mississippi State Highway No. 305; SE1/4SE1/4 sec. 22, T. 5 S., R. 6 W. The slope is 6 percent.

Ap—0 to 2 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, fine, granular and subangular blocky structure; friable; many fine roots; strongly acid; abrupt, smooth boundary.

B21—2 to 8 inches, yellowish-brown (10YR 5/4) silt loam; weak, fine to medium, subangular blocky structure; friable; common fine roots; strongly acid; clear, smooth boundary.

B22—8 to 15 inches, yellowish-brown (10YR 5/4) silt loam; moderate, fine to medium, subangular blocky structure; friable; few, fine, dark-brown concretions;

common fine roots; strongly acid; clear, smooth boundary.

B&A'2—15 to 19 inches, yellowish-brown (10YR 5/4) silt loam; common, medium, faint, pale-brown (10YR 6/3) and few, fine, faint, dark yellowish-brown (10YR 4/4) mottles; moderate, fine to medium, angular blocky and subangular blocky structure; friable; few discontinuous clay films; gray silt between cracks and on ped faces; few dark-brown concretions; few roots; strongly acid; irregular boundary.

A'2x—19 to 23 inches, dark-brown (7.5YR 4/4) and pale-brown (10YR 6/3) silt loam; weak, fine, subangular blocky peds with light-gray (10YR 7/1) silt covering; friable; many, fine, dark-brown concretions; many voids; few clay films; few roots; strongly acid; irregular boundary.

B'21tx—23 to 32 inches, brown to dark-brown (7.5YR 4/4) silt loam; common, medium, faint, pale-brown (10YR 6/3) mottles; moderate, medium to coarse, angular blocky and subangular blocky peds that are firm, compact, and brittle; light-gray (10YR 7/1) silt in polygonal cracks and on ped faces; continuous clay films around peds; many voids; few dark-brown concretions; strongly acid; gradual, smooth boundary.

B'22tx—32 to 60 inches +, brown to dark-brown (7.5YR 4/4) silt loam; common, medium, faint, pale-brown (10YR 6/3) mottles; weak, coarse, subangular blocky peds that are firm, compact, and brittle; light-gray (10YR 7/1) silt in polygonal cracks and on ped faces; many clay films; many voids; few dark-brown concretions; strongly acid.

The color of the surface layer ranges from dark grayish brown to dark yellowish brown. The color of the B horizon ranges from yellowish brown to dark brown, and the texture ranges from silt loam to light silty clay loam. The fragipan is at a depth of about 20 to 30 inches and ranges from about 2 feet to several feet in thickness.

Loring Series: The Loring series consists of moderately well drained to well drained, acid soils in the uplands. They are on narrow ridgetops and in nearly level areas adjacent to the flood plains of some of the larger streams. Slopes range from 0 to 5 percent. The Loring soils have developed in thick deposits of loess. They have a brown silt loam surface layer and a brown to dark-brown silty clay loam subsoil. These soils have a fragipan which is more than 30 inches from the surface in most places.

The Loring soils are mostly on ridgetops in the eastern half of the county. They occur with Grenada, Calloway, and Henry soils. The Loring soils are browner than these soils and in most places have a deeper and weaker fragipan.

The natural vegetation consists of mixed hardwoods with an understory of shade-tolerant small trees, low shrubs, vines, and a sparse stand of grasses.

Profile of Loring silt loam in a pasture 1½ miles south and ¼ mile east of Independence on the north roadbank, SE¼SW¼ sec. 35, T. 4 S., R. 6 W. The slope is 4 percent.

Ap—0 to 4 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; friable; many fine roots; strongly acid; clear, smooth boundary.

B&A—4 to 8 inches, yellowish-brown (10YR 5/4) silt loam with pockets of brown (10YR 5/3) silt loam; weak, fine, subangular blocky structure; friable; common fine roots; strongly acid; gradual, smooth boundary.

B21t—8 to 13 inches, brown to dark-brown (7.5YR 4/4) heavy silt loam; moderate, fine and medium, subangular blocky structure; friable; patchy clay films; common fine roots; strongly acid; clear, smooth boundary.

B22t—13 to 21 inches, brown to dark-brown (7.5YR 4/4) silty clay loam; moderate, medium, subangular blocky structure; friable; few patchy clay films; few fine roots; strongly acid; abrupt, smooth boundary.

B23t—21 to 33 inches, brown to dark-brown (7.5YR 4/4) silt loam; many, medium, faint, dark yellowish-brown (10YR 4/4) and distinct, light brownish-gray (10YR 6/2) mottles; friable; moderate, medium and coarse, subangular blocky structure; few pores; few patchy clay films; common, fine, black concretions and stains; gray silt coats on peds and in cracks; strongly acid; gradual, smooth boundary.

B31x—33 to 39 inches, mottled brown to dark-brown (7.5YR 4/4), dark yellowish-brown (10YR 4/4), and light brownish-gray (10YR 6/2) silt loam; moderate, medium and coarse, subangular blocky structure; friable; few pores; few patchy clay films; common, fine, black concretions and stains; gray silt in polygonal cracks and on peds; strongly acid; gradual, smooth boundary.

B32x—39 to 60 inches +, mottled dark yellowish-brown (10YR 4/4), gray to light-gray (10YR 6/1), and yellowish-brown (10YR 5/4) silt loam; moderate, medium and coarse, subangular blocky peds that are firm, compact, and brittle; gray silt in polygonal cracks and on peds; many black concretions and splotches; strongly acid.

The depth of the surface layer ranges from about 1 to 5 inches. The depth to the fragipan ranges from about 30 to 40 inches; its thickness ranges from about 1 to 3 feet.

Memphis Series: The Memphis series consists of deep, well-drained, acid soils in the uplands. Slopes range from 2 to 45 percent. Many of the ridgetops on which these soils occur are relatively broad and break abruptly to the steeper side slopes. The Memphis soils have developed in thick loess. They have a brown or dark grayish-brown surface layer and a brown to dark-brown silty clay loam to heavy silt loam subsoil. The C horizon is a dark yellowish-brown silt loam.

The Memphis soils are mainly in the western half of the county, excluding the Delta. They occur with the Loring, Grenada, Calloway, Henry, and Natchez soils. The Memphis soils are better drained than the Loring, Grenada, Calloway, and Henry and do not have a fragipan that is characteristic of these soils. The Memphis soils have stronger profile development and are more strongly acid than Natchez soils.

The natural vegetation consists of mixed hardwoods with an understory of shade-tolerant trees, low shrubs, vines, and a sparse stand of grasses.

Profile of Memphis silt loam, eroded, in a pasture about 3 miles west and 2½ miles north of the intersection of Mississippi State Highway No. 4 and U.S. Highway No. 51; northwest corner of sec. 9, T. 5 S., R. 8 W. The slope is 3 percent.

Ap—0 to 5 inches, brown to dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; many fine roots; medium acid; clear, smooth boundary.

B1—5 to 13 inches, brown to dark-brown (7.5YR 4/4) silt loam; weak, fine, subangular blocky structure; friable; many fine roots; strongly acid; clear, smooth boundary.

B21t—13 to 19 inches, brown to dark-brown (7.5YR 4/4) heavy silt loam; moderate, fine and medium, subangular blocky structure; friable; few gray silt coatings on ped faces and in cracks; patchy clay films; many fine roots; strongly acid; gradual, smooth boundary.

B22t—19 to 31 inches, brown to dark-brown (7.5YR 4/4) silty clay loam; moderate, medium, angular blocky and subangular blocky structure; friable; thin, discontinuous, clay patches on ped faces; some ped faces stained dark; few, fine, black concretions; few gray silt coatings on ped faces and in cracks; common fine roots; strongly acid; gradual, smooth boundary.

B3—31 to 43 inches, brown to dark-brown (7.5YR 4/4) heavy silt loam; moderate, medium, subangular blocky structure; friable; thin, discontinuous, clay patches on ped faces; some ped faces stained dark; few, fine, black

concretions; few fine roots; strongly acid; gradual, smooth boundary.

C—43 to 60 inches +, dark yellowish-brown (10YR 4/4) silt loam; structureless; some vertical cracks filled with light-gray (10YR 7/2) silt; friable; strongly acid.

The color of the A horizon ranges from dark grayish brown to dark brown. The texture of all the B horizons ranges from silty clay loam to heavy silt loam, and the total thickness ranges from about 25 to 45 inches. The C horizon is dark-brown to yellowish-brown silt loam, and in some places it has gray silt coatings in the vertical cracks.

NATCHEZ SERIES: The Natchez series consists of deep, somewhat excessively drained soils in the uplands. They are on steep, rough, broken topography and have slopes of 12 to 50 percent. The Natchez soils have developed in thick calcareous loess. They have a dark grayish-brown surface layer and brown B and C horizons. They have very weak profile development.

The Natchez soils are in the western part of the county in a band, approximately 3 miles wide, along the bluffs. These soils occur with the Memphis soils and are somewhat similar to them. The Natchez soils are more excessively drained than Memphis soils. Also, they are somewhat lighter in color and have less profile development.

The natural vegetation consists of mixed hickory, walnut, oak, maple, and other hardwoods and an understory of shade-tolerant shrubs. Most of the area is in trees. If it is cleared, this soil is susceptible to erosion.

Profile of Natchez silt loam in a wooded area ½ mile south of Treslow Methodist Church on the bank of an abandoned road 150 yards east of a gravel road across from the cemetery; northeast corner of SW¼ sec. 17, T. 6 S., R. 9 W. The slope is 25 percent.

O1—1 inch to 0, partly decomposed, matted leaves and twigs.

A1—0 to 3 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; very friable; nonplastic; many fine roots; medium acid; clear, smooth boundary.

A2—3 to 8 inches, brown to dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; nonplastic; many fine roots; medium acid; clear, smooth boundary.

B1—8 to 11 inches, yellowish-brown (10YR 5/4) silt loam; weak, coarse, subangular blocky structure; very friable; nonplastic; common fine roots; slightly acid; gradual, smooth boundary.

B2—11 to 26 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, coarse, subangular blocky structure; very friable, nonplastic; few fine roots; slightly acid; clear, smooth boundary.

C1—26 to 48 inches, yellowish-brown (10YR 5/4) silt loam; structureless; very friable; nonplastic; few fine roots; few, fine, white nodules; neutral to mildly alkaline; clear, smooth boundary.

C2—48 to 65 inches +, dark yellowish-brown (10YR 4/4) silt loam; structureless; very friable; nonplastic; few medium roots; few, fine, white nodules; moderately alkaline.

The surface layer ranges from brown to dark grayish brown, and from slightly acid to medium acid. The B horizon ranges from brown to yellowish brown and from slightly acid to medium acid. The C horizon ranges from dark yellowish brown to dark brown and from neutral to moderately alkaline.

RED-YELLOW PODZOLIC SOILS

This great soil group consists of well-developed, well-drained, acid soils formed under forest vegetation in a warm-temperate, humid climate. These soils have a thin organic AO horizon and an organic-mineral A1 horizon. The A1 horizon is underlain by a light-colored, bleached A2 horizon, that, in turn, is underlain by a red, yellowish-red, or yellow B horizon. The B horizon contains more clay than the horizons above. Parent materials are all more or less siliceous. Coarse, reticulate streaks or mottles of red, yellow, brown, and light gray characterize deep horizons of Red-Yellow Podzolic soils in places where the parent materials are thick (*10*).

Generally, the soils of this group have a low cation-exchange capacity and a low percentage of base saturation.

In Tate County, Providence and Ruston are the only soils in the Red-Yellow Podzolic great soil group.

PROVIDENCE SERIES: The Providence series consists of moderately well drained, acid soils in the uplands. These soils generally have slopes of 8 to 12 percent. They have developed in a thin mantle of loess over friable, sandy material of the Coastal Plain. In the less eroded areas of Providence soils, the surface layer is grayish brown to brown. The subsoil is dark yellowish-brown to dark-brown silt loam to silty clay loam underlain by loam or sandy loam that in most places is redder. A fragipan occurs near the contact of the subsoil and the underlying material.

The Providence soils occupy a small part of the county, and their entire acreage is in the extreme eastern part. They occur with Grenada, Loring, and Ruston soils. The Providence soils are similar to the Grenada and Loring in drainage and in color above the fragipan, but their lower subsoil is sandier and redder. The Providence soils have a mantle of loess 2 to 4 feet thick over Coastal Plain material and a fragipan. These are lacking in the Ruston soils.

The natural vegetation consists of mixed shortleaf and loblolly pines and hardwoods and an understory of shrubs. Most areas have been cleared and used for crops and pasture. Cultivated areas are susceptible to erosion.

Profile of Providence silt loam in a wooded area 1¼ miles southwest of Johnson's store in Tyro on the south side of a roadbank; northwest corner of the NE¼ sec. 16, T. 6 S., R. 5 W. The slope is 18 percent.

Ap—0 to 2 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable; many fine roots; strongly acid; clear, smooth boundary.

A2—2 to 8 inches, pale-brown (10YR 6/3) silt loam; many, medium, faint, light yellowish-brown (10YR 6/4) mottles; weak, fine, granular and subangular blocky structure; friable; many fine roots; very strongly acid; abrupt, smooth boundary.

B21t—8 to 14 inches, mottled yellowish-brown (10YR 5/6) and dark yellowish-brown (10YR 4/4) heavy silt loam; moderate, fine and medium, subangular blocky structure; friable; common fine and medium roots; few patchy clay films; strongly acid; clear, wavy boundary.

B22t—14 to 19 inches, brown to dark-brown (7.5YR 4/4) light silty clay loam; common, medium, faint, yellowish-brown (10YR 5/4) mottles; moderate, medium, subangular blocky structure; friable; few patchy clay films; common fine roots; strongly acid; clear, wavy boundary.

IIB23t—19 to 25 inches, brown to dark-brown (7.5YR 4/4) silt loam; many, medium, faint, yellowish-brown (10YR 5/4 to 5/8) mottles; light-gray (10YR 7/1) silt in cracks and between some ped faces; moderate, medium, subangular blocky structure; firm; patchy clay films; few fine roots; strongly acid; clear, smooth boundary.

IIB24tx—25 to 32 inches, mottled brown to dark-brown (7.5YR 4/4), yellowish-brown (10YR 5/4), and light-gray (10YR 7/1) fine sandy loam; moderate, medium, subangular blocky structure; firm, compact, and brittle; few patchy clay films; gray silt in polygonal cracks and on ped faces; strongly acid; clear, wavy boundary.

IIB25tx—32 to 40 inches, mottled brown to dark-brown (7.5YR 4/4), reddish-brown (5YR 4/4), and light-gray (10YR 7/1) sandy loam; moderate, medium, subangular blocky structure; firm, compact, and brittle; patchy clay films; gray silt in polygonal cracks and on ped faces; strongly acid; clear, wavy boundary.

IIB26tx—40 to 54 inches +, yellowish-red (5YR 4/6) sandy clay loam; many, coarse, faint, strong-brown (7.5YR 5/6) mottles; light-gray (10YR 7/2) silt in cracks; moderate, medium, subangular blocky structure; friable; nearly continuous clay films on ped faces; strongly acid.

The A horizon ranges from 5 to 10 inches in thickness and from brown to dark grayish brown in color. The B horizon ranges from heavy silt loam to silty clay loam in texture and from dark yellowish brown to dark brown in color. The loess cap ranges from 1½ to 3 feet in thickness. The fragipan ranges from 20 to 30 inches in depth from the surface and from 1 to 3 feet in thickness. The underlying material is brown to yellowish-red sandy clay loam to loamy sand.

Ruston Series: The Ruston series consists of deep, well-drained, acid soils in the uplands. They are in steep, rough, broken areas that have slopes of 17 to 45 percent. The Ruston soils have developed in sandy loam, loam, and sandy clay loam of the Coastal Plain. They have a brown fine sandy loam surface layer and a yellowish-red sandy clay loam to sandy loam B horizon. The C horizon is yellowish-red sandy loam to loamy sand.

The Ruston soils are in the eastern part of the county near the Tate-Marshall County line. They occur predominantly with Providence soils. They are better drained, sandier, and redder than the Providence soils and lack the fragipan that is characteristic of those soils.

The natural vegetation consists of shortleaf and loblolly pines mixed with hardwoods and an understory of shrubs, bushes, and grasses. In Tate County the entire area of Ruston soils is covered by timber. Cleared areas would be susceptible to severe erosion.

Profile of Ruston fine sandy loam in a wooded area 2¼ miles west of Johnson's store at Tyro, on the west bank of gravel road ¼ mile north of the point where it makes a sharp turn north; northwest corner of SW¼ sec. 5, T. 6 S., R. 5 W. The slope is 18 percent.

Ap—0 to 6 inches, brown (10YR 5/3) very fine sandy loam; weak, fine, granular structure; very friable; many fine roots; strongly acid; abrupt, smooth boundary.

B1—6 to 9 inches, yellowish-red (5YR 5/6) fine sandy loam; common, medium, distinct, brown to dark-brown (7.5YR 4/4) mottles; weak, fine, subangular blocky structure; very friable; many fine roots; very strongly acid; clear, smooth boundary.

B21t—9 to 17 inches, yellowish-red (5YR 4/6) sandy clay loam; weak, medium, subangular blocky structure; friable; common fine roots and few medium roots; patchy clay films and bridging of sand grains; very strongly acid; gradual, smooth boundary.

B22t—17 to 27 inches, yellowish-red (5YR 4/6) fine sandy loam; weak, medium, subangular blocky structure; friable; few patchy clay films and bridging of sand grains; few fine roots; very strongly acid, gradual, smooth boundary.

B3t—27 to 48 inches, yellowish-red (5YR 4/6) sandy loam; weak, fine, subangular blocky structure; very friable; common clay bridges; few fine roots; very strongly acid; abrupt, smooth boundary.

C—48 to 66 inches +, yellowish-red (5YR 4/8) loamy sand with a 1-inch layer of very pale brown (10YR 7/4) sand at the top and occasional streaks and pockets of this sand throughout the horizon; single grain (structureless); very friable; very strongly acid.

The A horizon ranges from 6 to 11 inches in thickness and from brown to grayish brown in color. The B horizon ranges from heavy sandy loam to sandy clay loam. It ranges in thickness from about 12 inches in a few places to about 42 inches but is commonly about 3 feet thick. Sandstone fragments are scattered throughout the profile in places and measure as much as 1 inch by 6 inches. Larger pieces of sandstone as large as 4 feet by 4 feet occur at the surface in some places.

Soils of the intrazonal order

The intrazonal order consists of soils with more or less well-developed soil characteristics that reflect the dominant influence of some local factor of relief or parent material over the effect of climate and living organisms. Soils of the intrazonal order have some properties of zonal and azonal soils, but the characteristics resulting from the local conditions are dominant.

The soils of the intrazonal order in Tate County are members of the Low-Humic Gley and the Planosol great soil groups.

LOW-HUMIC GLEY SOILS

The Low-Humic Gley great soil group consists of somewhat poorly drained to poorly drained soils in the intrazonal order. They have a thin surface horizon that contains a moderate amount of organic matter. This horizon is underlain by a mottled gray and brown, gleyed, mineral horizon that differs little from the surface layer in texture. Low-Humic Gley soils range from sand to clay in texture. The parent materials of these soils vary widely in physical and chemical properties. These soils occur largely under a natural cover of swamp forest and probably of marsh plants in some places. A large part of the acreage ranges from medium acid to very strongly acid, but some is neutral or alkaline (*10*).

In Tate County the Alligator, Dowling, and Waverly soils are in the Low-Humic Gley great soil group.

Alligator Series: The Alligator series consists of poorly drained, acid, level to nearly level, clayey soils on low bottom lands of the Delta. They developed in fine-textured Mississippi River alluvium. They have a dark-gray to dark grayish-brown, thin silty clay loam to clay surface soil. The subsoil is a gray or light-gray, plastic clay distinctly mottled with shades of brown.

The Alligator soils are the predominant soils throughout the Delta. They occur in broad, nearly level areas with the Dundee and Dowling soils. They are not so well drained as the Dundee and are finer textured and more plastic throughout. The Alligator soils are similar to the Dowling soils in color, drainage, and texture; but they are at slightly higher elevations. The Dowling soils are in narrow drainageways and depressions within the areas of Alligator soils.

The natural vegetation consists of mixed hardwoods, cypress, vines, and water-tolerant grasses. Large areas of these soils have been cleared and are used for crops.

Profile of Alligator clay in a recently cleared area near Prichard, 1⅝ miles east of the point where a gravel road crosses the Coldwater River and 500 feet north of road; northeast corner of SW¼SE¼ sec. 25, T. 4 S., R. 10 W. The slope is 1 percent.

- A1—0 to 3 inches, dark-gray (10YR 4/1) clay; moderate, fine, granular structure; very hard; firm; very plastic and very sticky; many fine roots; strongly acid; clear, smooth boundary.
- C1g—3 to 21 inches, gray (10YR 5/1) clay; many, medium, distinct, dark yellowish-brown (10YR 4/4) and yellowish-brown (10YR 5/6) mottles; massive; very hard; firm; very plastic and very sticky; common fine and medium roots; strongly acid; diffuse, smooth boundary.
- C2g—21 to 33 inches, dark-gray (N 4/0) clay; many, medium distinct, dark yellowish-brown (10YR 4/4) mottles; massive; very hard; firm; very plastic and very sticky; common slickensides; strongly acid to medium acid; diffuse, smooth boundary.
- C3g—33 to 48 inches +, light-gray to gray (10YR 6/1) clay; many, medium, distinct, dark yellowish-brown (10YR 4/4) mottles; massive; very hard; firm; very plastic and very sticky; common slickensides; neutral.

The color of the surface layer ranges from dark gray to brown mottled with gray. The depth to the gray mottles ranges from 0 to 6 inches. The subsoil is gray to light-gray, heavy, plastic clay. In most places yellowish-brown or brown mottles are present in the lower part of the subsoil.

Profile of Alligator silty clay loam in a cultivated field ½ mile south of Savage, 40 feet south and 40 feet west of the intersection of Mississippi State Highway No. 3 and the Illinois Central Railroad; northwest corner of NE¼ sec. 26, T. 5 S., R. 10 W. The slope is 1 percent.

- Ap—0 to 4 inches, dark grayish-brown (10YR 4/2) silty clay loam; weak, fine, granular structure; friable; slightly sticky and slightly plastic; many fine roots; strongly acid; abrupt, smooth boundary.
- C1g—4 to 28 inches, gray (10YR 5/1) silty clay or clay; many, medium, distinct, brown to dark-brown (7.5YR 4/4) mottles; massive; hard; firm; very sticky and very plastic; many, fine and medium, black concretions; few fine roots; strongly acid; clear, smooth boundary.
- C2g—28 to 48 inches +, dark-gray (10YR 4/1) clay; many, medium and coarse, distinct, brown (7.5YR 5/4) mottles; massive; very hard; very firm; very sticky and very plastic; few, fine, black concretions; common slickensides; strongly acid.

The color of the surface layer ranges from dark gray to brown mottled with gray. The depth to the gray mottles ranges from 0 to 6 inches. The subsoil is a dark-gray to light-gray, heavy, plastic clay. In most places the subsoil is mottled with brown or yellowish brown.

DOWLING SERIES: The Dowling series consists of poorly drained, acid, clayey soils that are nearly level or in depressions. They have developed partly in alluvium deposited in slackwater by the Mississippi River and partly in alluvium washed from the surrounding higher soils. The Dowling soils have a dark-brown to gray mottled clay surface layer about 3 inches thick and a gray, heavy, plastic clay subsoil mottled with brown.

The Dowling soils are in the western edge of the county on the Mississippi River flood plain, commonly called the Delta. They occur with the Alligator soils. The Dowling and Alligator soils are similar in color, texture, and drainage; but the Dowling soils occupy the narrow, winding drainageways and depressions, whereas the Alligator soils are in the broad, nearly level areas at slightly higher elevations.

The natural vegetation consists of mixed hardwoods, cypress, vines, and water-tolerant grasses. A large part of the acreage of Dowling soils has been cleared and now is used chiefly for soybeans and rice.

Profile of Dowling clay in a recently cleared depression near Prichard, 1¾ miles east of a point where a gravel road crosses the Coldwater River and 250 feet north of the road; SE¼SE¼ sec. 25, T. 4 S., R. 10 W.

- A1—0 to 3 inches, mottled brown to dark-brown (10YR 4/3) and gray (10YR 5/1) clay; weak, fine, granular structure; hard; very plastic and very sticky; few fine roots; strongly acid; clear, smooth boundary.
- C1g—3 to 20 inches, gray (N 5/0) clay; many, medium, distinct, yellowish-brown (10YR 5/4) mottles; massive; hard; very plastic and very sticky; common fine roots; strongly acid; diffuse, smooth boundary.
- C2g—20 to 30 inches, dark-gray (N 4/0) clay; common, medium, distinct, dark yellowish-brown (10YR 4/4) mottles; massive; hard; very plastic and very sticky; few fine and medium roots; strongly acid to medium acid; diffuse, smooth boundary.
- C3g—30 to 48 inches +, gray to light-gray (N 6/0) clay; many, medium and coarse, distinct, brown to dark-brown (7.5YR 4/4) mottles; massive; hard; very plastic and very sticky; common slickensides; strongly acid.

The depth to the gray mottles ranges from 0 to 6 inches, but in most places the mottles begin at the surface. The subsoil ranges from dark gray to light gray in color and has few to many yellowish-brown to dark-brown mottles.

WAVERLY SERIES: The Waverly series consists of poorly drained, acid soils in alluvium. These soils are in depressions and in areas that have slopes of 0 to 2 percent. They have a mottled gray and brown silt loam surface layer about 3 inches thick. The C horizon is gray silt loam with brown mottles. The gray mottles are within 6 inches of the surface.

The Waverly soils are in small areas throughout the bottom lands of the county, but they are mostly in the northern and western parts along the Coldwater River. They occur with Collins and Falaya soils. The Waverly soils are more poorly drained than either of these soils and have gray mottles nearer the surface.

The natural vegetation consists of mixed hardwoods, cypress, and water-tolerant grasses. Much of the acreage of this soil has been cleared and now is used chiefly for pasture or for soybeans.

Profile of Waverly silt loam in a wooded area 1 mile east and ½ mile south of Cottonville and ¼ mile north of the Arkabutla Canal; SW¼NE¼ sec. 17, T. 5 S., R. 9 W.

- O1—1 inch to 0, layer of partly decayed leaves and twigs from mixed hardwoods.
- A1g—0 to 3 inches, grayish-brown (10YR 5/2) silt loam; common, fine, distinct, brown to dark-brown (7.5YR 4/4) mottles; weak, fine, granular structure; friable; common, fine, brown to dark-brown concretions; many fine and medium roots; strongly acid; clear, smooth boundary.
- C1g—3 to 10 inches, gray to light-gray (10YR 6/1) silt loam; few, medium, faint, brown (10YR 5/3) and common, fine, distinct, strong-brown (7.5YR 5/6) mottles; structureless; friable; common dark-brown to black stains or soft concretions along root channels; common fine and medium roots; strongly acid; clear, smooth boundary.
- C2g—10 to 39 inches, mottled gray to light-gray (10YR 6/1) and brown to dark-brown (10YR 4/3) silt loam; structureless; friable; common dark-brown to black

stains along root channels; common, soft, black concretions decreasing in number and size with depth; few fine roots; strongly acid; gradual, smooth boundary.

C3g—39 to 50 inches +, gray to light-gray (N 6/0) silt loam with common, distinct streaks and pockets of strong-brown (7.5YR 5/6) mottles; structureless; friable; strongly acid.

The texture of the surface layer is silt loam in most places, but it ranges to silty clay loam in some. The color of the surface layer ranges from brown to gray, but in most places it is brown-and-gray mottled. The gray mottles are within 6 inches of the surface. The C horizon is generally gray and has brown mottles. In most places dark-brown concretions of manganese occur throughout the profile. The texture of the C horizons is silt loam in most places, but it ranges to silty clay loam in a few.

PLANOSOLS

Planosols are intrazonal soils having one or more horizons abruptly separated from and sharply contrasting to an adjacent horizon because of cementation, compaction, or large clay content. The soils developed under forest or grass vegetation in mesothermal to tropical perhumid to semiarid climate. In most places, but not all, there was a fluctuating water table. In many places the cemented or compacted horizons are below a moderately well developed or well developed B horizon that has a higher percentage of clay than the A horizon (*10*).

In Tate County the Calloway and Henry soils are members of the Planosol great soil group.

CALLOWAY SERIES: The Calloway series consists of somewhat poorly drained, acid soils in the uplands. These soils have slopes of 0 to 5 percent. They have developed in thick loess. They have a brown or mottled brown and gray silt loam surface layer and a yellowish-brown silt loam subsoil. The subsoil is underlain at a depth of about 14 inches by a fragipan, which in most places has a greater content of clay.

The Calloway soils are in nearly level uplands adjacent to the flood plains of the major streams and in small areas scattered throughout the hilly part of the county. They occur with Memphis, Loring, Grenada, and Henry soils. The Calloway soils are grayer and more poorly drained and have a stronger fragipan than the Memphis, Loring, and Grenada soils. They are better drained than the Henry soils and are browner throughout the profile.

The natural vegetation consists of mixed hardwoods. Most of the acreage has been cleared and is used for pasture and row crops.

Profile of Calloway silt loam in a cultivated field 3¼ miles west and 1½ miles south of Senatobia and 350 yards east of a gravel road and 50 yards north of a line fence; SW¼SE¼ sec. 34, T. 5 S., R. 8 W. The slope is 2 percent.

Ap—0 to 5 inches, brown to dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; friable; many fine roots; slightly acid; abrupt, smooth boundary.

B—5 to 11 inches, yellowish-brown (10YR 5/4) silt loam; few, fine, faint, pale-brown (10YR 6/3) mottles; weak, fine and medium, subangular blocky structure; friable; few, fine and medium, black and brown concretions; few fine roots; strongly acid; clear, smooth boundary.

B&A'2—11 to 14 inches, light yellowish-brown (10YR 6/4) silt loam; many, fine, pale-brown (10YR 6/3) and few, fine, distinct, light brownish-gray (10YR 6/2) mottles; moderate, fine and medium, subangular blocky structure; friable; many voids; many gray silt coatings on face of peds and in cracks; many, fine and medium, brown and black concretions; strongly acid; irregular boundary.

A'2x—14 to 16 inches, light-gray (10YR 7/1) silt loam; many, fine, distinct, pale-brown (10YR 6/3) and yellowish-brown (10YR 5/6) mottles; weak, fine, subangular blocky structure; friable; common, fine and medium, brown and black concretions; strongly acid; irregular boundary.

B'21tx—16 to 30 inches, silty clay loam that is mottled pale brown (10YR 6/3), dark yellowish brown (10YR 4/4), light brownish gray (10YR 6/2), and brown to dark brown (7.5YR 4/4); moderate, medium and coarse, angular and subangular blocky structure; very firm, compact, brittle; continuous clay film on peds and in pores; common voids; many gray silt coatings on face of peds and in polygonal cracks; common brown and black concretions; strongly acid; clear, smooth boundary.

B'22tx—30 to 52 inches +, silt loam that is mottled light gray (10YR 7/2), pale brown (10YR 6/3), yellowish brown (10YR 5/6), and brown to dark brown (7.5YR 4/4); weak, medium, subangular blocky structure; firm, compact, brittle; few clay films in cracks and pores; gray silt coatings on peds and in polygonal cracks; strongly acid.

The A horizon ranges from mottled gray and very dark grayish brown to dark brown in color. In cultivated areas the Ap horizon is brown to dark brown. The B horizon ranges from silt loam to light silty clay loam in texture and, in most places, has a larger content of clay in the lower part. The fragipan ranges from about 10 to 20 inches in depth and from about 2 to 4 feet in thickness.

HENRY SERIES: The Henry series consists of poorly drained, strongly acid soils in the uplands. They are in broad, nearly level areas adjacent to the flood plains of the larger streams, and they are also in depressions and nearly level areas scattered throughout the hilly part of the county. Slopes are 0 to 2 percent. The Henry soils have formed in thick loess. These soils have a very dark grayish-brown silt loam surface layer and gray silt loam underlying layers. They have a fragipan that, in most places, is less than 15 inches from the surface.

The largest areas of Henry soils are east of Coldwater in the broad, nearly level uplands adjacent to the flood plain of the Coldwater River. The Henry soils occur with the Memphis, Loring, Grenada, Calloway, Falaya, and Waverly soils. They are more poorly drained and grayer than the Memphis, Loring, Grenada, or Calloway soils. They more closely resemble the Falaya and Waverly soils, but these soils formed in alluvium.

The natural vegetation consists of mixed hardwoods. Most areas of Henry soils have been cleared and are used for pasture.

Profile of Henry silt loam in an idle field 2½ miles east of U.S. Highway No. 51 and 1 mile north of State Highway No. 306, about 30 yards north of an abandoned road and 300 yards west of the corner of a gravel road; SW¼SW¼ sec. 22, T. 4 S., R. 7 W. The slope is 1 percent.

Ap—0 to 4 inches, brown (10YR 5/3) silt loam; common, medium, distinct, light brownish-gray (10YR 6/2) mottles; weak, fine, granular structure; friable; few, fine and medium, dark-brown concretions; many fine roots; strongly acid, abrupt, smooth boundary.

A21g—4 to 8 inches, light brownish-gray (2.5Y 6/2) silt loam; common, fine and medium, distinct, dark yellowish-brown (10YR 4/4) mottles; weak, fine, subangular blocky structure; friable; few, medium, brown concretions; few voids; common fine roots; strongly acid; gradual, smooth boundary.

A22g—8 to 12 inches, light brownish-gray (2.5Y 6/2) silt loam; few, fine, distinct, dark yellowish-brown (10YR 4/4) mottles, weak to moderate, medium, subangular blocky structure; firm, slightly compact, and slightly brittle; few, fine, brown concretions; many voids; gray silt on ped faces and in cracks; few fine roots; strongly acid; gradual, smooth boundary.

A23gx&Bgx—12 to 28 inches, light brownish-gray (2.5Y 6/2) silt loam; few, medium, distinct, yellowish-brown (10YR 5/8) mottles; moderate, fine to coarse, subangular blocky structure; firm, compact, and brittle; common, fine and medium, dark-brown concretions; few clay films and clay pockets; gray silt on ped faces and in cracks; few fine roots; gradual, smooth boundary.

B21tgx—28 to 34 inches, light brownish-gray (2.5Y 6/2) heavy silt loam; moderate, medium, subangular blocky structure; common clay pockets and films; common, very fine and medium, dark-brown concretions and stains; ped faces covered with gray silt; firm, compact, brittle; strongly acid; clear, smooth boundary.

B22tgx—34 to 40 inches, mottled light brownish-gray (2.5Y 6/2) and yellowish-brown (10YR 5/6) heavy silt loam; weak, coarse, subangular blocky structure; few, very fine, dark-brown concretions; peds covered with gray silt; firm, compact, brittle; strongly acid; clear, smooth boundary.

B3gx—40 to 52 inches +, light brownish-gray (2.5Y 6/2) silt loam; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; structureless; common, fine and medium, black, veiny stains; gray silt in cracks; friable to firm; strongly acid.

The color of the surface layer ranges from very dark grayish brown to grayish brown. The texture of the B horizons ranges from silt loam to light silty clay loam. The depth to the fragipan ranges from near the surface to about 15 inches. In most places the fragipan is several feet thick.

Soils of the azonal order

The azonal order is composed of soils that lack distinct, genetically related horizons because the soils are young, have resistant parent material, or have steep slopes. Most soils that have developed in relatively recent alluvium are in this order. In Tate County, the only great soil group in the azonal order is Alluvial soils.

ALLUVIAL SOILS

Alluvial soils developed from transported and relatively recently deposited material (alluvium) that is characterized by a weak modification (or none) of the original material by soil-forming processes (*13*).

The Adler, Arkabutla, Collins, Falaya, Morganfield, and Wakeland soils are members of the Alluvial great soil group.

Adler Series: The Adler series consists of deep, moderately well drained, slightly acid to mildly alkaline, bottom-land soils that are nearly level to gently sloping. They have developed in alluvium from loess. The Adler soils have a yellowish-brown silt loam surface layer about 5 inches thick. The C horizons are yellowish-brown silt loam mottled with pale brown and gray.

The Adler soils are on bottom lands along the western edge of the hilly part of the county and in some small areas on the Delta adjacent to the bluffs. They occur with the Collins, Falaya, Morganfield, and Wakeland soils. The Adler soils have more gray mottles in the upper 18 to 30 inches than the Morganfield soils and are not so well drained. They are better drained than the Falaya and Wakeland soils. The Adler soils are similar to the Collins soils in color, texture, and drainage, but they are slightly acid to mildly alkaline, whereas the Collins soils are acid.

The natural vegetation consists of ash, hickory, oak, maple, yellow-poplar, and other mixed hardwoods. Most areas have been cleared and are used for cotton, corn, and soybeans.

Profile of Adler silt loam, local alluvium, in a field 1.4 miles west of Strayhorn and 50 yards south of Mississippi State Highway No. 4; NW¼NE¼ sec. 32, T. 5 S., R. 9 W. The slope is 3 percent.

Ap—0 to 6 inches, dark grayish-brown (10YR 4/2) silt loam; common, medium, distinct, brown to dark-brown (7.5YR 4/4) and common, medium, faint, pale-brown (10YR 6/3) mottles; weak, fine, granular structure; very friable; many fine roots; slightly alkaline; clear, smooth boundary.

C1—6 to 16 inches, brown to dark-brown (10YR 4/3) silt loam; few, medium, distinct, brown to dark-brown (7.5YR 4/4) and few, fine, faint, pale-brown (10YR 6/3) mottles; few light brownish-gray (10YR 6/2) mottles in lower part; stratified; structureless; very friable; common fine roots; slightly alkaline; clear, smooth boundary.

C2—16 to 24 inches, mottled yellowish-brown (10YR 5/4), pale-brown 10YR 6/3), light brownish-gray (10YR 6/2), and dark yellowish-brown (10YR 4/4) silt loam; stratified; structureless; friable; few, fine, dark-brown concretions and stains; few fine roots; slightly alkaline; clear, smooth boundary.

C3g—24 to 40 inches +, grayish-brown (10YR 5/2) silt loam; many, medium, faint, pale-brown (10YR 6/3) and many, medium, distinct, brown to dark-brown (7.5YR 4/4) mottles; structureless; friable; common dark-brown and black concretions and stains: few, fine, charcoallike remains of old roots; slightly alkaline.

The color of the surface layer ranges from yellowish brown to dark grayish brown. The depth to the gray mottles ranges from about 18 to 30 inches. In most places slopes are about 3 percent, but in a few small areas adjacent to the bluffs they are as much as 6 percent.

Arkabutla Series: The Arkabutla series consists of somewhat poorly drained, acid soils formed in alluvium that washed primarily from soils formed in silty materials. The Arkabutla soils have a dark yellowish-brown silty clay loam surface layer about 8 inches thick. The C horizons are brown to gray silty clay loam and have gray mottles between a depth of 6 and 18 inches.

In Tate County Arkabutla soils are primarily on bottom lands along the Coldwater River. They are associated with the Falaya, Waverly, and Collins soils. The Arkabutla soils are more poorly drained and are finer textured than the Collins, and they are better drained than the Waverly soils. They closely resemble the Falaya soils in color and in drainage. In texture, however, the surface and subsurface layers of the Arkabutla soils are silty clay loam, whereas those of the Falaya soils are silt loam.

The natural vegetation consists of mixed hardwoods, cypress, vines, and water-tolerant grasses. A few fields have been cleared and drained, but most of the acreage has remained in hardwoods.

Profile of Arkabutla silty clay loam in a cultivated field 3 miles west and 3½ miles north of Arkabutla along the Coldwater River 30 feet south and 20 feet west of a fence corner; northwest corner of SE¼ sec. 8, T. 4 S., R. 9 W. The slope is 1 percent.

Ap—0 to 8 inches, dark yellowish-brown (10YR 4/4) silty clay loam; massive; friable; slightly sticky; many fine roots; medium acid; abrupt, smooth boundary.

C1—8 to 14 inches, dark yellowish-brown (10YR 4/4) silty clay loam; many, medium, faint, pale-brown (10YR 6/3) mottles and distinct, light brownish-gray (10YR 6/2) mottles; massive; friable; slightly plastic; few fine roots; slightly acid; clear, smooth boundary.

C2g—14 to 25 inches, gray to light-gray (10YR 6/1) silty clay loam; common, medium, distinct, yellowish-brown (10YR 5/8) mottles and common, coarse, distinct, dark yellowish-brown (10YR 4/4) mottles; massive; slightly plastic; common, medium, soft, black concretions and stains; few fine roots; strongly acid to medium acid; gradual, smooth boundary.

C3g—25 to 37 inches, gray to light-gray (10YR 6/1) silty clay loam; few, medium, faint, pale-brown (10YR 6/3) mottles and common reddish-brown (5YR 4/4) stains along old root channels; massive; slightly plastic; common, medium, soft, black concretions and stains; medium acid; gradual, smooth boundary.

C4g—37 to 48 inches +, mottled gray (N 5/0), dark yellowish-brown (10YR 4/4), and brown to dark-brown (7.5YR 4/4) silty clay loam; becomes yellowish red (5YR 4/8) in lower part; massive; slightly plastic; common, medium, soft, black concretions and stains; slightly acid.

The Ap horizon ranges from yellowish brown to dark brown in color and in places is dark grayish brown. The C horizons are mottled with various shades of yellow, brown, and gray. Gray mottles occur between a depth of 6 and 18 inches. The texture of the Ap and C horizons is silty clay loam in most places but ranges from heavy silt loam to light silty clay.

COLLINS SERIES: The Collins series consists of deep, moderately well drained, acid soils. They have developed in alluvium from loess. They are nearly level to gently sloping. The Collins soils have a dark-brown silt loam surface layer and a brown silt loam subsoil that has gray mottles at a depth of 18 to 30 inches.

The Collins soils are on bottom lands in all parts of the county except the Delta. They occur with the Adler, Falaya, Morganfield, Wakeland, and Waverly soils. The Collins soils are more acid than the Adler, Morganfield, and Wakeland soils. They are better drained than the Falaya and Waverly soils.

The natural vegetation consists of mixed ash, gum, elm, yellow-poplar, and other hardwoods. Most areas have been cleared and are used for crops and pastures.

Profile of Collins silt loam in a cultivated field on the Green Valley Farm 1 mile south of Mississippi State Highway No. 4 and ⅛ mile west of the Senatobia Canal; SW¼SW¼ sec. 34, T. 5 S., R. 7 W.

Ap—0 to 7 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; very friable; many fine roots; strongly acid; abrupt, smooth boundary.

C1—7 to 20 inches, dark yellowish-brown (10YR 4/4) silt loam; structureless; friable; few worm casts; common fine roots; very strongly acid; clear, smooth boundary.

C2—20 to 26 inches, yellowish-brown (10YR 5/4) silt loam; few, medium, distinct, light brownish-gray (10YR 6/2) mottles; structureless; friable; few fine roots; very strongly acid; clear, smooth boundary.

C3g—26 to 40 inches +, mottled light brownish-gray (10YR 6/2), yellowish-brown (10YR 5/4), and pale-brown (10YR 6/3) silt loam; structureless: friable; common, fine and medium, black concretions; very strongly acid.

The surface layer ranges from brown to dark brown in color. The C horizons range from yellowish brown to dark brown. The depth to gray mottles ranges from 18 to 30 inches. The Collins soils range from medium acid to very strongly acid.

Profile of Collins silt loam, local alluvium, in a pasture 4⅗ miles west of the intersection of State Highway No. 4 and U.S. Highway No. 51 and ¼ mile south of State Highway No. 4; SE¼SW¼ sec. 28, T. 5 S., R. 8 W. The slope is 3 percent.

Ap—0 to 6 inches, brown to dark-brown (10YR 4/3) silt loam with splotches of pale brown (10YR 6/3) and a few mottles of light brownish gray (10YR 6/2); weak, fine to medium, granular structure; friable; many fine roots; strongly acid; clear, smooth boundary.

C1—6 to 19 inches, brown to dark-brown (10YR 4/3) coarse silt loam with thinly stratified layers of pale brown (10YR 6/3) and brown (10YR 5/3); weak, thin, platelike structure, probably caused by deposition; friable; nonplastic; common brown stains around roots; few fine roots; strongly acid; clear, smooth boundary.

C2—19 to 26 inches, brown to dark-brown (10YR 4/3) silt loam stratified with layers of pale brown (10YR 6/3); weak, platelike structure that may indicate deposition; friable; nonplastic; common, fine, soft, brown and black concretions; few, thin, streaks of light brownish gray (10YR 6/2) in lower part; few fine roots; strongly acid; clear, smooth boundary.

C3—26 to 42 inches, dark yellowish-brown (10YR 4/4) silt loam; many, medium and coarse, brown to dark-brown (10YR 4/3), pale-brown (10YR 6/3), and light brownish-gray (10YR 6/2) mottles that are in stratified layers; weak, platelike structure; friable; common dark-brown and black concretions; few roots; strongly acid; clear, smooth boundary.

C4—42 to 47 inches, brown to dark-brown (10YR 4/3) silt loam mottled with yellowish brown (10YR 5/4) and light brownish gray (10YR 6/2); structureless; friable; few brown and black concretions; few roots; strongly acid; clear, smooth boundary.

C5—47 to 52 inches +, mottled brown to dark-brown (10YR 4/3), light brownish-gray (10YR 6/2), and yellowish-brown (10YR 5/4) silt loam; structureless; slightly plastic; many black and brown concretions; strongly acid.

The surface layer ranges from brown to dark brown in color. The C horizons are brown to yellowish brown and in most places are stratified with various shades of yellow and brown. The depth to gray mottles ranges from 18 to 30 inches.

FALAYA SERIES: The Falaya series consists of somewhat poorly drained, acid, nearly level to level soils that have developed in alluvium from loess. They have a brown to yellowish-brown silt loam surface layer about 8 inches thick. The C horizon is brown to gray silt loam that is mottled with gray between a depth of 6 and 18 inches.

The Falaya soils are on flood plains throughout the county. They occur with the Collins, Waverly, Adler, Morganfield, and Arkabutla soils. The Falaya soils are more acid than the Adler and Morganfield and are not so well drained. They are more poorly drained than the Collins and better drained than Waverly soils. The Falaya soils closely resemble the Arkabutla soils in color and in drainage, but they are coarser textured throughout and have silt loam surface and subsurface layers, whereas the Arkabutla soils have silty clay loam surface and subsurface layers.

The natural vegetation consists of mixed hardwoods, cypress, vines, and water-tolerant grasses. Most areas have been cleared for cultivated crops.

Profile of Falaya silt loam in cultivated field 3 miles west and ¾ mile south of Senatobia and 100 feet west and 50 feet south of the junction of gravel roads; NW¼NW¼ sec. 35, T. 5 S., R. 8 W. The slope is 1 percent.

Ap—0 to 8 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; very friable; common fine roots; strongly acid; clear, smooth boundary.

C1—8 to 13 inches, brown (10YR 5/3) silt loam; few, fine, faint, light-gray (10YR 7/2), pale-brown (10YR 6/3), and dark yellowish-brown (10YR 4/4) mottles; structureless; friable; few fine roots; strongly acid; clear, smooth boundary.

C2g—13 to 31 inches, silt loam that is mottled yellowish brown (10YR 5/4), light gray (10YR 7/2), brown to dark brown (10YR 4/3), and pale brown (10YR 6/3); few fine streaks of dark yellowish brown (10YR 4/4); structureless; friable; few fine roots; common, fine, soft, dark-brown concretions; strongly acid; clear, smooth boundary.

C3g—31 to 45 inches +, light-gray (10YR 7/1) silt loam; few, medium, faint, pale-brown (10YR 6/3) and few, fine, faint, dark-brown (10YR 4/3) mottles; structureless; friable; few, fine, soft, dark-brown concretions; strongly acid.

The A horizon ranges from yellowish brown to dark brown and in some places to dark grayish brown. The C horizon is mottled with various shades of yellow, brown, and gray. The gray mottles occur between a depth of 6 and 18 inches.

MORGANFIELD SERIES: The Morganfield series consists of deep, well-drained, slightly acid to alkaline soils on bottom lands. They are nearly level to gently sloping. These soils have developed in alluvium from loess. The Morganfield soils have a dark grayish-brown to yellowish-brown silt loam surface layer about 6 inches thick. Beneath the surface layer are brown silt loam C horizons that are free of gray mottles to a depth of 30 inches or more.

The Morganfield soils are on bottom lands along the western edge of the hilly part of the county and in small areas on the Delta adjacent to the bluffs. They occur with Adler, Collins, Falaya, and Wakeland soils. The Morganfield soils are browner and are better drained than any of these soils.

The natural vegetation consists of mixed ash, hickory, oak, maple, yellow-poplar, and other hardwoods. Most areas have been cleared and are used for cotton, corn, and soybeans.

Profile of Morganfield silt loam, local alluvium, in a cultivated field 2¾ miles west and 1¼ miles north of Arkabutla, 25 yards east of a ditch and 25 feet north of a gravel road; SW¼SE¼ sec. 20, T. 4 S., R. 9 W.

Ap—0 to 6 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable; many fine roots; mildly alkaline; clear, smooth boundary.

C1—6 to 13 inches, yellowish-brown (10YR 5/4) silt loam; structureless; friable; few fine roots; mildly alkaline; gradual, smooth boundary.

C2—13 to 25 inches, brown (10YR 4/3) silt loam; few, fine, faint, brown (10YR 5/3) and few, fine, distinct, yellowish-brown (10YR 5/8) mottles, structureless; friable; few fine roots; few, fine, soft, black concretions; few pores; mildly alkaline; clear, smooth boundary.

C3g—25 to 48 inches +, brown (10YR 4/3) silt loam; few, fine, faint mottles of pale brown (10YR 6/3) and dark yellowish brown (10YR 3/4); structureless; friable; few, fine, soft, black concretions; few pores; neutral.

The surface layer ranges from dark grayish brown to yellowish brown in color. The depth to gray drainage mottles ranges from 30 inches to several feet. The soil ranges from slightly acid to mildly alkaline.

WAKELAND SERIES: The Wakeland series consists of somewhat poorly drained, slightly acid to mildly alkaline soils that are nearly level. They have formed in silty alluvium. The Wakeland soils have a brown silt loam surface layer about 8 inches thick. The C horizons are mottled yellow, brown, and gray silt loam. The gray mottles are between 6 and 18 inches below the surface.

The Wakeland soils are on flood plains along the western edge of the hilly part of the county. They occur with the Adler, Collins, Falaya, and Morganfield soils. The Wakeland soils are not so well drained as the Adler, Collins, and Morganfield. They are similar to the Falaya soils in color, texture, and drainage, but they are slightly acid to mildly alkaline, whereas the Falaya soils are strongly acid.

The natural vegetation consists of mixed hardwoods. Most areas of these soils have been cleared and are used for row crops and pasture.

Profile of Wakeland silt loam in a cultivated field 2 miles east of Cottonville and ¼ mile east and ¼ mile south of junction of gravel roads; NE¼SW¼ sec. 9, T. 5 S., R. 9 W. The slope is 2 percent.

Ap—0 to 8 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; very friable; many fine roots; slightly acid; abrupt, smooth boundary.

C1—8 to 11 inches, dark yellowish-brown (10YR 4/4) silt loam; common, medium, distinct, gray to light-gray (10YR 6/1) mottles and few, fine, faint, brown to dark-brown (7.5YR 4/4) mottles; structureless to weak platy structure; friable; common fine roots; slightly acid; clear, smooth boundary.

C2g—11 to 17 inches, light brownish-gray (10YR 6/2) silt loam; common, medium, faint, brown (10YR 5/3) mottles; structureless; friable; many dark-red to black stains; few, soft, black concretions; few fine roots; slightly acid; gradual, smooth boundary.

C3g—17 to 25 inches, mottled grayish-brown (10YR 5/2) and brown to dark-brown (10YR 4/3) silt loam; structureless; friable; common, medium, dark-brown to black stains and soft concretions; neutral; gradual, smooth boundary.

C4g—25 to 45 inches, silt loam mottled gray to light gray (10YR 6/1) and yellowish brown (10YR 5/4); structureless; friable; common, medium, dark-brown to black stains and soft concretions; mildly alkaline.

The A horizon ranges from dark grayish brown to yellowish brown in color. The C horizons are mottled with various shades of brown, gray, and yellow. Depth to the gray drainage mottles is between 6 and 18 inches.

Additional Facts About the County

In this section, early history and development, climate, water supply, and cultural facilities of the county are discussed, and some agricultural statistics are given.

History and Development

This area was first explored in the mid 1500's by Hernando De Soto. In 1803, treaties with the Choctaw, Creek, and Chickasaw Indians gave colonists the right to build trails through their lands. Senatobia became a rest stop on the trail from Pontotoc, Miss., to Helena, Ark. A large Indian settlement was in the area now known as Wyatte. Many Indians were in the Savage, Strayhorn, and Arkabutla areas. Jim Wolf was the last Indian chief in the area.

The U.S. Government first bought land from the In-

dians under terms of the Pontotoc Indian cession. The first white settlers bought land from the Government in 1836 for $1.25 per acre. The settlers came from the Carolinas, Georgia, Virginia, Tennessee, and Alabama.

The first railroad was built into the area in 1856. In 1860 there were 140 people living in Senatobia, which had a post office.

Tate County was formed in 1873 from parts of De Soto, Marshall, and Tunica Counties. It was named for Simpson Tate, a prominent landowner of that period. The county was first represented in the Mississippi Legislature in 1874. In 1890 Tate County had a population of 19,250. According to the U.S. Census, the population in 1960 was 18,138.

Climate

The principal factors that determine the climate of Tate County are (1) the subtropical latitude, (2) the huge land mass to the north, (3) the nearness to the warm water in the Gulf of Mexico, and (4) the prevailing southerly winds. Usually these factors combine to make the summers hot and humid and the winters mild and humid. All seasons have ample precipitation. Temperature and precipitation data for the county are summarized in table 8.

Usually in summer the prevailing southerly winds provide a moist, tropical climate, but occasionally the atmospheric pressure distribution brings westerly or northerly winds that cause hot dry weather. If this weather is persistent, drought may develop, as in 1924, 1925, 1954, and 1960. In winter, this county is subjected alternately to moist, tropical air and dry, polar air. Consequently, there are sometimes large and sudden changes in temperature. Temperatures below freezing, however, usually last only a short time. For this reason, the snow that falls (usually 2 out of every 3 years during January) stays on the ground for only a few days.

Winter and spring are the wettest seasons, and summer and fall are the driest. In winter and spring the precipitation often comes as prolonged rains. These rains are usually the result of warm moist air from the Gulf that overruns a mass of cold air at the surface. Precipitation during the summer and early in fall is in the form of thundershowers. These showers are generally widely scattered, and some particular area may be missed day after day. Consequently, local drought results. In a 24-hour period, precipitation of 3 inches or more may occur in any month and cause local flash floods.

Temperatures of 32°F. or lower occur on an average of 65 days a year, and temperatures of 90° or higher on an average of 85. Temperatures of 90° or higher occur in about 10 percent of the hours from May to October, and temperatures of 80° or higher occur in about 32 percent. During the period from November through April, temperatures of 70° or higher occur in about 8 percent of the hours and below 50° in about 40 percent. Temperatures of 20° or lower occur at least once every year. Freezing of the ground also occurs, but the freezing is shallow and thawing generally is rapid.

The relative humidity is high the year round. It averages between 60 and 100 percent about 67 percent of the time. Even when the temperature is below 50°, the relative humidity is between 80 and 100 percent 37 percent of the time. When the temperature is above 90°, the relative humidity does not exceed 80 percent.

Although thunderstorms occur frequently, tornadoes are infrequent. Only one has been reported since 1916. Winds of hurricane force do not penetrate as far north as

TABLE 8.—*Temperature and precipitation data for Tate County, Mississippi*

Month	Temperature				Precipitation				
	Average daily maximum	Average daily minimum	2 years in 10 will have at least 4 days with— Maximum temperature equal to or higher than—	2 years in 10 will have at least 4 days with— Minimum temperature equal to or lower than—	Average total	1 year in 10 will have— Less than—	1 year in 10 will have— More than—	Days with snow cover of 1.0 inch or more	Average depth of snow on days with snow cover
	°F.	°F.	°F	°F.	Inches	Inches	Inches	Number	Inches
January	54	33	72	14	6.1	2.6	10.9	1	2.5
February	57	36	73	21	4.9	2.1	8.3	(1)	1.6
March	65	42	81	23	5.9	3.3	8.3	0	0
April	75	51	86	36	5.2	2.3	8.3	0	0
May	83	59	93	46	4.0	2.4	6.2	0	0
June	91	66	99	56	3.6	1.0	6.2	0	0
July	93	70	99	60	4.1	.8	7.9	0	0
August	93	69	101	59	3.3	.8	6.6	0	0
September	87	62	98	45	3.1	1.1	5.5	0	0
October	78	50	89	35	2.7	.8	5.2	0	0
November	64	39	80	24	4.6	2.0	7.1	0	0
December	55	35	73	19	5.3	2.6	9.7	(1)	1.5
Year	75	51	[2] 102	[3] 9	52.8	37.1	65.3	1	2.0

[1] Less than 1 day.
[2] Average annual maximum.
[3] Average annual minimum.

TABLE 9.—*Probabilities of last adverse temperature in spring and first in fall*

[The data in this table are from the Batesville weather station in adjoining Panola County but are applicable to most of Tate County. Probabilities for temperatures of 36 and 40 degrees are based on the period 1931 to 1960; for all other temperatures, they are based on the period 1921 to 1950]

Probability	Temperature and dates for given probability				
	24° F.	28° F.	32° F.	36° F.	40° F.
Spring:					
1 year in 10 later than	March 20	March 31	April 16	April 23	May 4.
2 years in 10 later than	March 13	March 25	April 9	April 20	April 30.
5 years in 10 later than	February 28	March 13	March 30	April 13	April 22.
Fall:					
1 year in 10 earlier than	November 7	October 25	October 12	October 4	September 25.
2 years in 10 earlier than	November 14	October 31	October 17	October 9	September 30.
5 years in 10 earlier than	November 25	November 11	October 27	October 18	October 10.

Tate County, but winds from gales have occurred once in the last 85 years. Heavy rains, however, may result from these extratropical storms.

The probable dates of the last adverse temperature in spring and the first in fall are given in table 9. With the aid of this table, the farm manager can estimate the probability of damage to a specified crop.

At night under a clear sky and in calm air, frost can form on plants when the temperature 5 feet above the ground in a shelter is above 32° F. For this reason, and because low temperatures, even though they are above freezing, can adversely affect plants or seeds in a plant bed, the probability for temperatures of 36° and 40° are shown in the table. The probability for temperatures 36° and 40° is based on the period from 1931 to 1960; for all other temperatures, it is based on the period from 1921 to 1950. The data have been adjusted to account for years when the temperature was not so low as that shown in the table.

Water Supply

About 52.8 inches of rain falls on Tate County each year, and the water supply is adequate. The Coldwater River forms the western boundary of the county and Arkabutla Reservoir and the Coldwater River form about two-thirds of the northern boundary. Several creeks run through the county, and, in addition, there are more than 400 farm ponds.

Drinking water is obtained by drilling wells to a depth of about 100 feet. Commercial wells 4 inches or more in diameter obtain water at depths of 250 feet or deeper. There is no indication that the water table is being lowered in the county.

Cultural Facilities

There are 11 public secondary schools in the county. In addition, the county residents help to support a public junior college at Senatobia. Buses transport students from all parts of the county. There are more than 40 churches in the county.

Fishing and boating are the two major recreational attractions in the county. In addition to Arkabutla Reservoir, more than 400 farm ponds in the county are stocked with fish.

A passenger and freight line of the Illinois Central Railroad goes through Senatobia, and a freight line crosses the western edge of the county. Among the highways in the county are Interstate Highway No. 55 and U. S. Highway No. 51 and Mississippi State Highways Nos. 2, 3, 4, 305, and 306. Most other roads have a gravel surface and are usable throughout the year.

Telephone service is provided throughout the county. A power and light company and an electric power association furnish electricity to the county. A county paper is published weekly at Senatobia, and a 5,000-watt radio station is operated nearby.

Agriculture

The principal income in Tate County is from farming. Cotton has always been the most important crop. After the acreage of cotton was restricted in 1934, however, the production of other crops and the raising of livestock have increased. Although many workers have left the farm to work in industry and many farmers receive a substantial part of their income from work off the farm, the county is still largely agricultural.

The size of farms in the county is increasing, and the number of farms is decreasing. Also, the acreage of cropland harvested is decreasing, and the acreage of permanent pasture is increasing. The acreage of woodland has increased in recent years because of the planting of pine trees on steep or severely eroded land. The trend in size of farms is toward the larger, more economical units.

According to the U.S. Census of Agriculture, there were 225,315 acres in farms in 1959. The census lists the number of farms by size and total acreage in each size group as follows:

Size of farm:	*Number of farms*	*Acreage*
Less than 50 acres	1,371	24,814
50 to 99 acres	346	25,585
100 to 219 acres	309	45,169
220 to 499 acres	144	47,570
500 to 999 acres	50	34,642
1,000 or more acres	32	47,535

In 1959 there were 646 miscellaneous and unclassified farms in Tate County. The rest were classified according to type as follows:

Type of farm:	Number of farms
Cotton	1,275
Cash-grain	8
Poultry	6
Dairy	97
Livestock other than poultry and dairy	196
General	22
Vegetable	5

One-third of the farm operators in the county did work off the farm in 1959, and half of those worked 100 days or more. Of all farm operators, 23 percent indicated that their income from work off the farm exceeded their farm income. The trend in the county seems to be toward an increase in the income from work off the farm.

According to the U.S. census of 1959, 733 farms were operated by full owners, 323 by part owners, 14 by managers, and 1,185 by tenants.

The Mississippi Crop and Livestock Reporting Service (*7*) reported the acreage of important crops in 1961. The results are shown in the following list.

Crop	Acres
Cotton	25,200
Corn	10,700
Soybeans	5,700
Oats	600

The acreage of hay crops as given in the 1959 census is shown in the following list.

Crop	Acres
All land from which hay was cut	5,000
Alfalfa and alfalfa mixtures	14
Clover and mixtures of clover and grasses	199
Lespedeza	3,961
Small grain	270
Other hay cut	556

The number of livestock on farms, as shown in the 1959 census, are listed as follows:

	Number
Cattle and calves	32,981
Cows, including heifers that have calved	19,320
Milk cows	6,827
Heifer and calves	9,129
Steers and bulls (including calves)	4,532
Horses and mules	2,989
Hogs and pigs	10,644
Sheep and lambs	97
Chickens 4 months and older	70,524
Turkey hens kept for breeding	375

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Glossary

Aerobic. Living or active only in the presence of oxygen.

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Anaerobic. Living or active only in the absence of oxygen.

Available water capacity. The capacity of a soil to hold water in a form available to plants. Amount of moisture held in soil between field capacity, or about one-third atmosphere of tension, and the wilting coefficient or about 15 atmospheres of tension.

Bluffs. The steep upland part of the landscape adjacent to the Mississippi Alluvial Plain, or Delta.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrations of compounds, or of soil grains cemented together. The composition of some concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are examples of material commonly found in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent; will not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Delta. Generally considered the Mississippi Alluvial Plain.

Film, clay. A thin coating of clay on the surface of a soil aggregate.

Fragipan. A loamy, brittle, subsurface horizon that is very low in organic matter and clay but is rich in silt or very fine sand. The layer is seemingly cemented when dry, has a hard or very hard consistence, and has a high bulk density in comparison with the horizon or horizons above it. When moist, the fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur below the B horizon, 15 to 40 inches below the surface.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes.

Mottled. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: Abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are these: fine, less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse,* more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Reaction. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Mildly alkaline	7.4 to 7.8
Very strongly acid	4.5 to 5.0	Moderately alkaline	7.9 to 8.4
Strongly acid	5.1 to 5.5	Strongly alkaline	8.5 to 9.0
Medium acid	5.6 to 6.0	Very strongly alkaline	9.1 and higher
Slightly acid	6.1 to 6.5		
Neutral	6.6 to 7.3		

Root zone. The part of the soil that is penetrated, or can be penetrated, by plant roots.

Sand. Individual rock or mineral fragments in soils having diameters ranging from 0.05 to 2.0 millimeters. Most sand grains consists of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregate longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular, and granular). *Structureless* soils are (1) *single grain* (each grain by itself, as in dune sand) or (2) *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the profile below plow depth.

Slack water. A period at the crest of a flood when there is no horizontal motion of the floodwater.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surplus runoff so that it may soak into the soil or flow slowly to a prepared outlet without harm. Terraces in fields are generally built so they can be farmed. Terraces intended mainly for drainage have a deep channel that is maintained in permanent sod.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

V-ditches. Drainage ditches that are V-shaped and have smooth side slopes.

W-ditches. Two parallel drainage ditches, each having a V-shaped cross section, and the excavated material from the ditches placed between them.

Water table. The highest part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

GUIDE TO MAPPING UNITS, CAPABILITY UNITS, AND WOODLAND SUITABILITY GROUPS

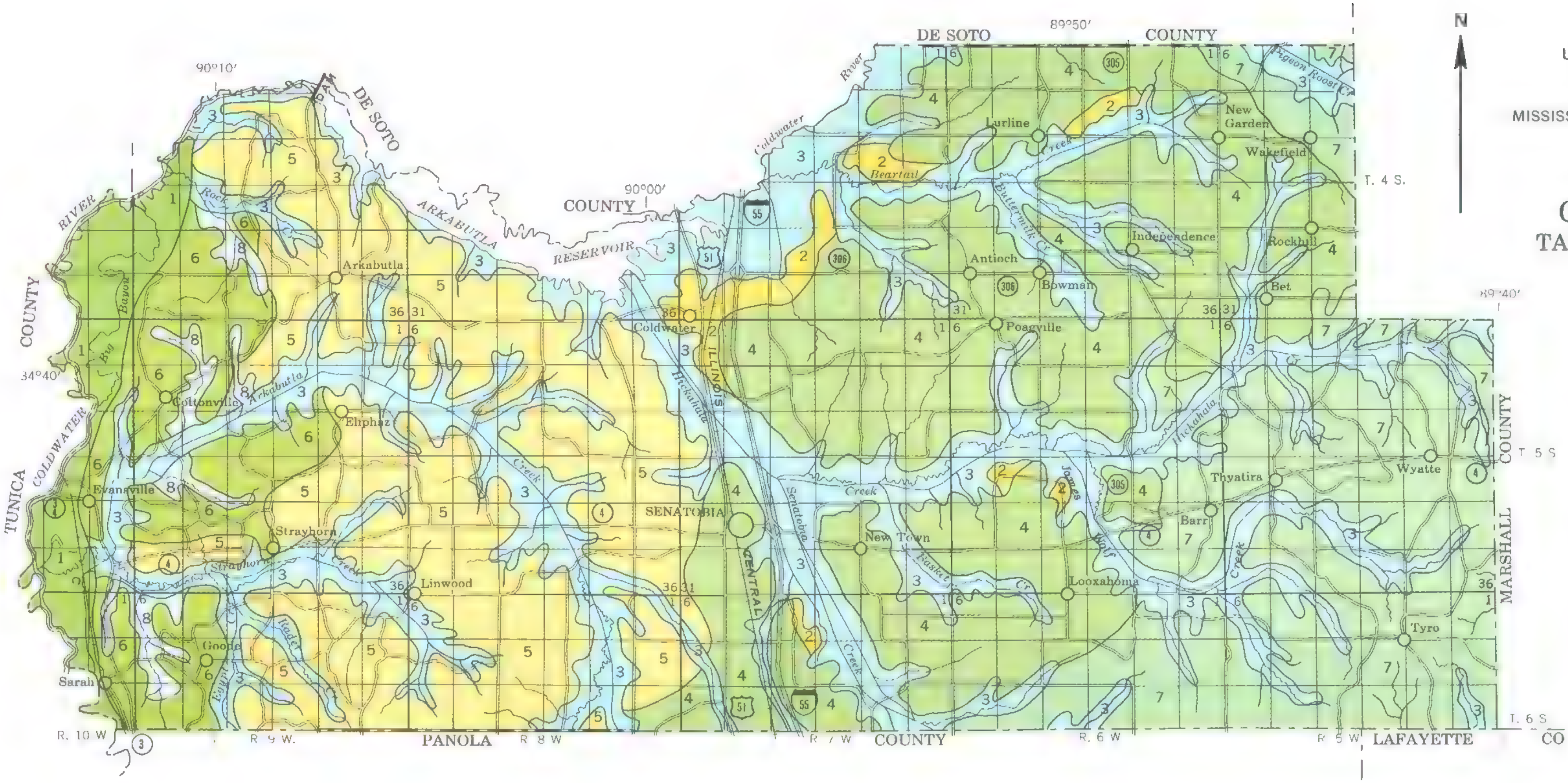
[See table 1, p. 8, for approximate acreage and proportionate extent of the soils, and table 2, p. 40, for estimated yields. See pp. 57 to 68 for information on the use of soils for engineering]

Map symbol	Mapping unit	Described on Page	Capability unit Symbol	Capability unit Page	Woodland suitability group Number	Woodland suitability group Page
Aa	Adler silt loam, local alluvium	9	I-1	30	1	44
Ag	Adler and Morganfield silt loams	9	IIw-3	32	1	44
Am	Adler and Morganfield silt loams, local alluvium	9	I-1	30	1	44
Ao	Alligator clay	10	IIIw-2	34	2	44
Ar	Alligator silty clay loam	10	IIIw-2	34	2	44
As	Alligator-Dowling association	10	Vw-1	36	--	--
	Alligator part	--	------	--	2	44
	Dowling part	--	------	--	7	48
At	Alluvial land	11	IIIw-1	34	13	51
Au	Arkabutla silty clay loam	11	IVw-1	36	3	45
CaA	Calloway silt loam, 0 to 2 percent slopes	12	IIw-5	32	5	45
CaB	Calloway silt loam, 2 to 5 percent slopes	12	IIw-5	32	5	45
CaB2	Calloway silt loam, 2 to 5 percent slopes, eroded	12	IIw-5	32	5	45
Cm	Collins silt loam	12	IIw-3	32	6	45
Co	Collins silt loam, local alluvium	13	I-1	30	6	45
Dc	Dowling clay	14	Vw-1	36	7	48
DnA	Dundee loam, 0 to 2 percent slopes	14	I-2	30	4	45
DsA	Dundee silty clay loam, 0 to 2 percent slopes	14	IIw-1	31	4	45
Fa	Falaya silt loam	15	IIw-4	32	3	45
GrC	Grenada silt loam, 5 to 8 percent slopes	15	IIIe-3	33	8	48
GrC2	Grenada silt loam, 5 to 8 percent slopes, eroded	15	IIIe-3	33	8	48
GrC3	Grenada silt loam, 5 to 8 percent slopes, severely eroded	15	IVe-2	35	8	48
GrD	Grenada silt loam, 8 to 12 percent slopes	16	IVe-3	35	8	48
GrD2	Grenada silt loam, 8 to 12 percent slopes, eroded	16	IVe-3	35	8	48
GrD3	Grenada silt loam, 8 to 12 percent slopes, severely eroded	16	VIe-2	37	8	48
Gs	Grenada-Gullied land complex	17	VIe-6	38	12	50
Gt	Gullied land, sandy	17	VIIe-3	38	12	50
Gu	Gullied land, silty	17	VIIe-3	38	12	50
He	Henry silt loam	18	IVw-3	36	5	45
LgA	Loring-Grenada silt loams, 0 to 2 percent slopes	18	IIw-2	31	8	48
LgB	Loring-Grenada silt loams, 2 to 5 percent slopes	18	IIe-2	31	8	48
LgB2	Loring-Grenada silt loams, 2 to 5 percent slopes, eroded	19	IIe-2	31	8	48
LgB3	Loring-Grenada silt loams, 2 to 5 percent slopes, severely eroded	19	IIIe-2	33	8	48
Ma	Made land	19	IIIs-1	34	13	51
MeB2	Memphis silt loam, 2 to 5 percent slopes, eroded	20	IIe-1	31	15	51
MeB3	Memphis silt loam, 2 to 5 percent slopes, severely eroded	20	IIIe-1	33	15	51
MeC2	Memphis silt loam, 5 to 8 percent slopes, eroded	20	IIIe-1	33	15	51
MeC3	Memphis silt loam, 5 to 8 percent slopes, severely eroded	20	IIIe-1	33	15	51
MeD2	Memphis silt loam, 8 to 12 percent slopes, eroded	21	IVe-1	35	15	51
MeD3	Memphis silt loam, 8 to 12 percent slopes, severely eroded	21	IVe-1	35	15	51
MeE2	Memphis silt loam, 12 to 17 percent slopes, eroded	21	VIe-1	36	9	49
MeE3	Memphis silt loam, 12 to 17 percent slopes, severely eroded	21	VIe-1	36	9	49
MeF	Memphis silt loam, 17 to 45 percent slopes	21	VIe-1	36	14	51
MeF3	Memphis silt loam, 17 to 45 percent slopes, severely eroded	22	VIIe-1	38	9	49
Mg	Memphis-Gullied land complex	22	VIe-5	37	9	49
NmE	Natchez-Memphis silt loams, 12 to 17 percent slopes	23	VIe-1	36	--	--
	Natchez silt loam part	--	-----	--	14	51
	Memphis silt loam part	--	-----	--	9	49
NmF	Natchez-Memphis silt loams, 17 to 50 percent slopes	23	VIe-1	36	--	--
	Natchez silt loam part	--	-----	--	14	51
	Memphis silt loam part	--	-----	--	9	49
PoD3	Providence silt loam, 8 to 12 percent slopes, severely eroded	24	VIe-2	37	8	48
PrE	Providence-Ruston complex, 12 to 17 percent slopes	24	VIe-3	37	11	50
PrE3	Providence-Ruston complex, 12 to 17 percent slopes, severely eroded	24	VIIe-2	38	11	50
RpF	Ruston-Providence complex, 17 to 50 percent slopes	25	VIIe-2	38	11	50
Sm	Smoothed silty land	26	VIe-4	37	9	49
Wk	Wakeland silt loam	26	IIw-4	32	3	45
Wv	Waverly silt loam	26	IVw-2	36	10	50

NRCS Accessibility Statement

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
MISSISSIPPI AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP
TATE COUNTY, MISSISSIPPI



SOIL ASSOCIATIONS

1 Alligator-Dowling association: Poorly drained clayey soils on the flood plain of the Mississippi River

2 Calloway-Henry association: Somewhat poorly to poorly drained silty soils of the uplands

3 Collins-Falaya association: Acid silty soils of the bottom lands

4 Grenada-Loring association: Silty upland soils that have a fragipan

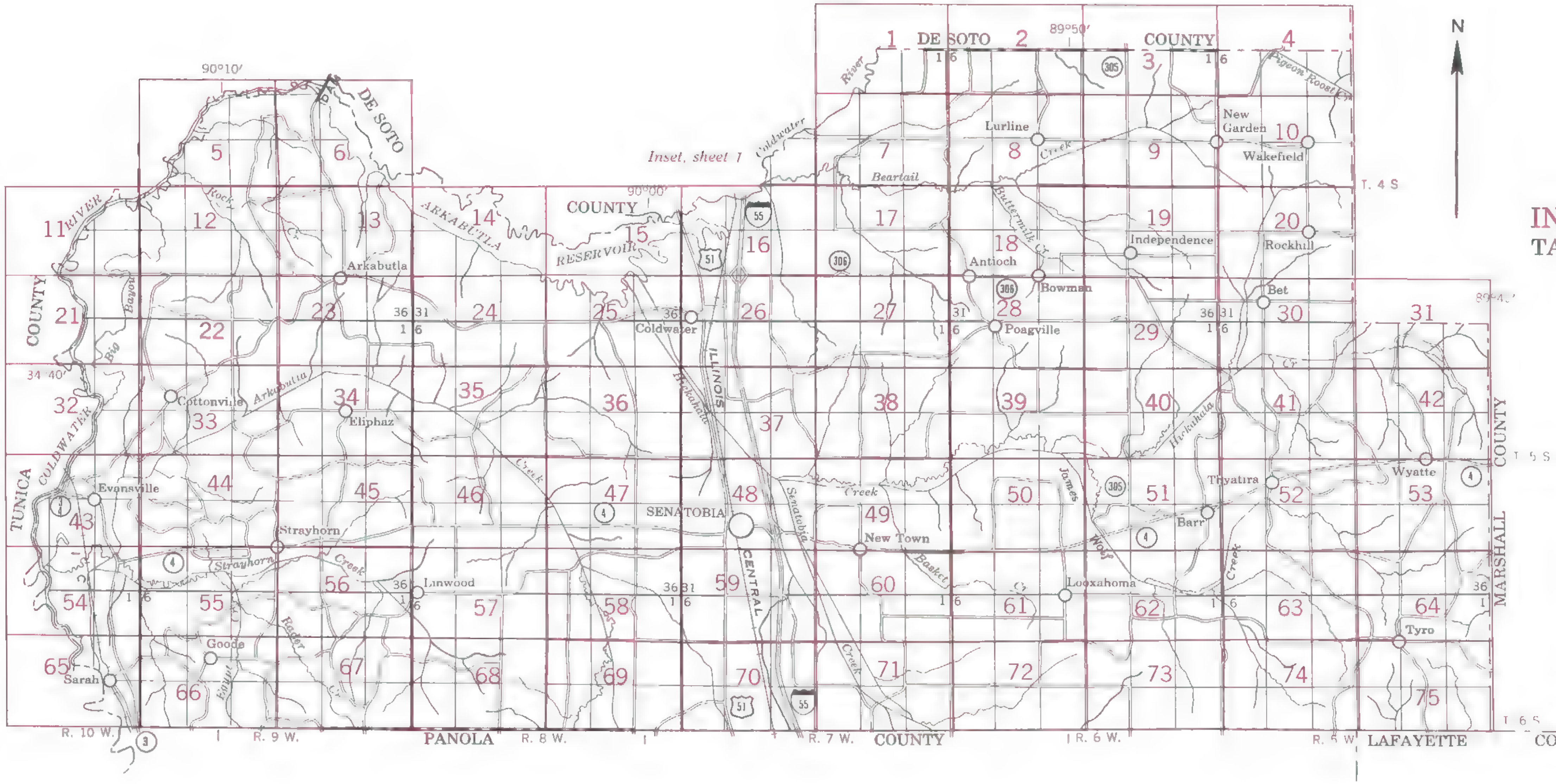
5 Memphis association: Well-drained, silty soils of the uplands

6 Natchez-Memphis association: Well-drained silty soils on ridges and bluffs

7 Ruston-Providence association: Silty and sandy soils in rough, broken areas

8 Adler-Morganfield-Wakeland association: Neutral to alkaline silty soils on bottom lands

October 1965



INDEX TO MAP SHEETS

TATE COUNTY, MISSISSIPPI

CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Highways and roads
- Dual
- Good motor
- Poor motor
- Trail

Highway markers
- National Interstate
- U. S.
- State

Railroads
- Single track
- Multiple track
- Abandoned

Bridges and crossings
- Road
- Trail, foot
- Railroad
- Ferries
- Ford
- Grade
- R. R. over
- R. R. under
- Tunnel

Buildings
- School
- Church
- Cotton gin

Mines and Quarries

Mine dump

Pits, gravel or other

Power lines

Pipe lines

Cemeteries

Dams

Levees

Tanks

Oil or gas wells

Forest fire or lookout station

BOUNDARIES

- National or state
- County
- Township, U. S.
- Section line, corner
- Reservation
- Land grant

DRAINAGE

Streams
- Perennial
- Intermittent, unclass.

Canals and ditches — CANAL / DITCH

Lakes and ponds
- Perennial
- Intermittent

Wells — flowing

Springs

Marsh

Wet spot

Alluvial fan

Drainage ends

RELIEF

Escarpments
- Bedrock
- Other

Prominent peaks

Depressions — Large / Small
- Crossable with tillage implements
- Not crossable with tillage implements
- Contains water most of the time

SOIL SURVEY DATA

- Soil boundary and symbol — Dx
- Gravel
- Stones
- Rock outcrops
- Chert fragments
- Clay spot
- Sand spot
- Gumbo or scabby spot
- Made land
- Severely eroded spot
- Blowout, wind erosion
- Gullies
- Indian mound

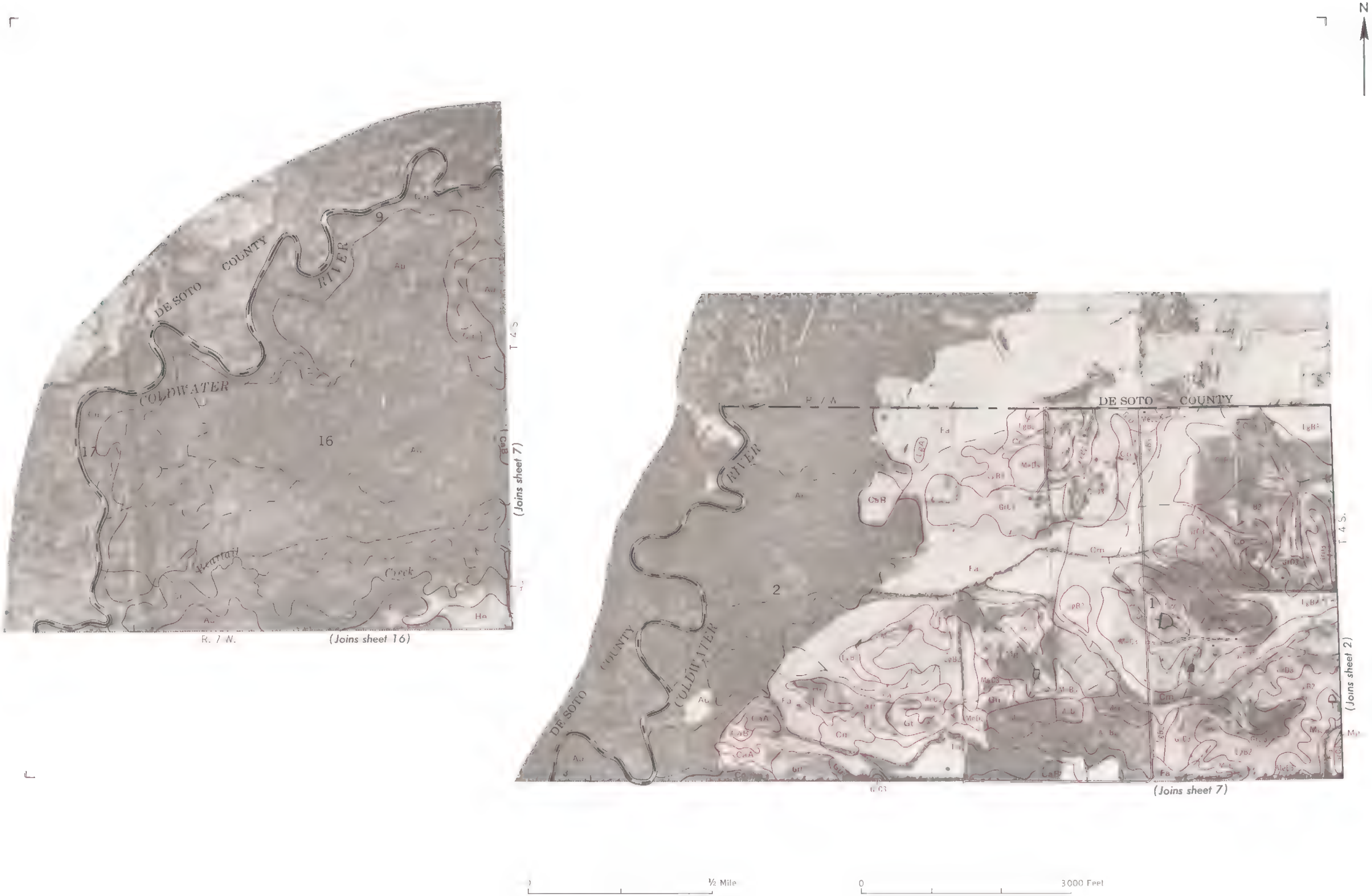
SOIL LEGEND

The first capital letter is the initial one of the soil name. A second capital letter, A, B, C, D, E, or F, shows the slope. Symbols for nearly level soils, such as Falaya silt loam, do not contain a slope letter. Neither does the symbol for a land type that has a considerable range in slope — Gullied land, sandy. The number, 2 or 3, in a symbol indicates that the soil is eroded or severely eroded.

SYMBOL	NAME
Aa	Adler silt loam, local alluvium
Ag	Adler and Morganfield silt looms
Am	Adler and Morganfield silt looms, local alluvium
Ao	Alligator clay
Ar	Alligator silty clay loam
As	Alligator—Dowling association
At	Alluvial land
Au	Arkabutla silty clay loam
CaA	Calloway silt loam, 0 to 2 percent slopes
CaB	Calloway silt loam, 2 to 5 percent slopes
CaB2	Calloway silt loam, 2 to 5 percent slopes, eroded
Cm	Collins silt loam
Co	Collins silt loam, local alluvium
Dc	Dowling clay
DnA	Dundee loam, 0 to 2 percent slopes
DsA	Dundee silty clay loam, 0 to 2 percent slopes
Fa	Falaya silt loam
GrC	Grenada silt loam, 5 to 8 percent slopes
GrC2	Grenada silt loam, 5 to 8 percent slopes, eroded
GrC3	Grenada silt loam, 5 to 8 percent slopes, severely eroded
GrD	Grenada silt loam, 8 to 12 percent slopes
GrD2	Grenada silt loam, 8 to 12 percent slopes, eroded
GrD3	Grenada silt loam, 8 to 12 percent slopes, severely eroded
Gs	Grenada—Gullied land complex
Gt	Gullied land, sandy
Gu	Gullied land, silty
He	Henry silt loam
LgA	Loring—Grenada silt loams, 0 to 2 percent slopes
LgB	Loring—Grenada silt loams, 2 to 5 percent slopes
LgB2	Loring—Grenada silt loams, 2 to 5 percent slopes, eroded
LgB3	Loring—Grenada silt loams, 2 to 5 percent slopes, severely eroded
Ma	Made land
MeB2	Memphis silt loam, 2 to 5 percent slopes, eroded
MeB3	Memphis silt loam, 2 to 5 percent slopes, severely eroded
MeC2	Memphis silt loam, 5 to 8 percent slopes, eroded
MeC3	Memphis silt loam, 5 to 8 percent slopes, severely eroded
MeD2	Memphis silt loam, 8 to 12 percent slopes, eroded
MeD3	Memphis silt loam, 8 to 12 percent slopes, severely eroded
MeE2	Memphis silt loam, 12 to 17 percent slopes, eroded
MeE3	Memphis silt loam, 12 to 17 percent slopes, severely eroded
MeF	Memphis silt loam, 17 to 45 percent slopes
MeF3	Memphis silt loam, 17 to 45 percent slopes, severely eroded
Mg	Memphis—Gullied land complex
NmE	Natchez—Memphis silt loams, 12 to 17 percent slopes
NmF	Natchez—Memphis silt loams, 17 to 50 percent slopes
PoD3	Providence silt loam, 8 to 12 percent slopes, severely eroded
PrE	Providence—Ruston complex, 12 to 17 percent slopes
PrE3	Providence—Ruston complex, 12 to 17 percent slopes, severely eroded
RpF	Ruston—Providence complex, 17 to 50 percent slopes
Sm	Smoothed silty land
Wk	Wakeland silt loam
Wv	Waverly silt loam

Soil map constructed 1965 by Cartographic Division, Soil Conservation Service, USDA, from 1962 aerial photographs. Controlled mosaic based on Mississippi plane coordinate system, west zone, transverse Mercator projection, 1927 North American datum.

Range, township, and section corners shown on this map are indefinite.

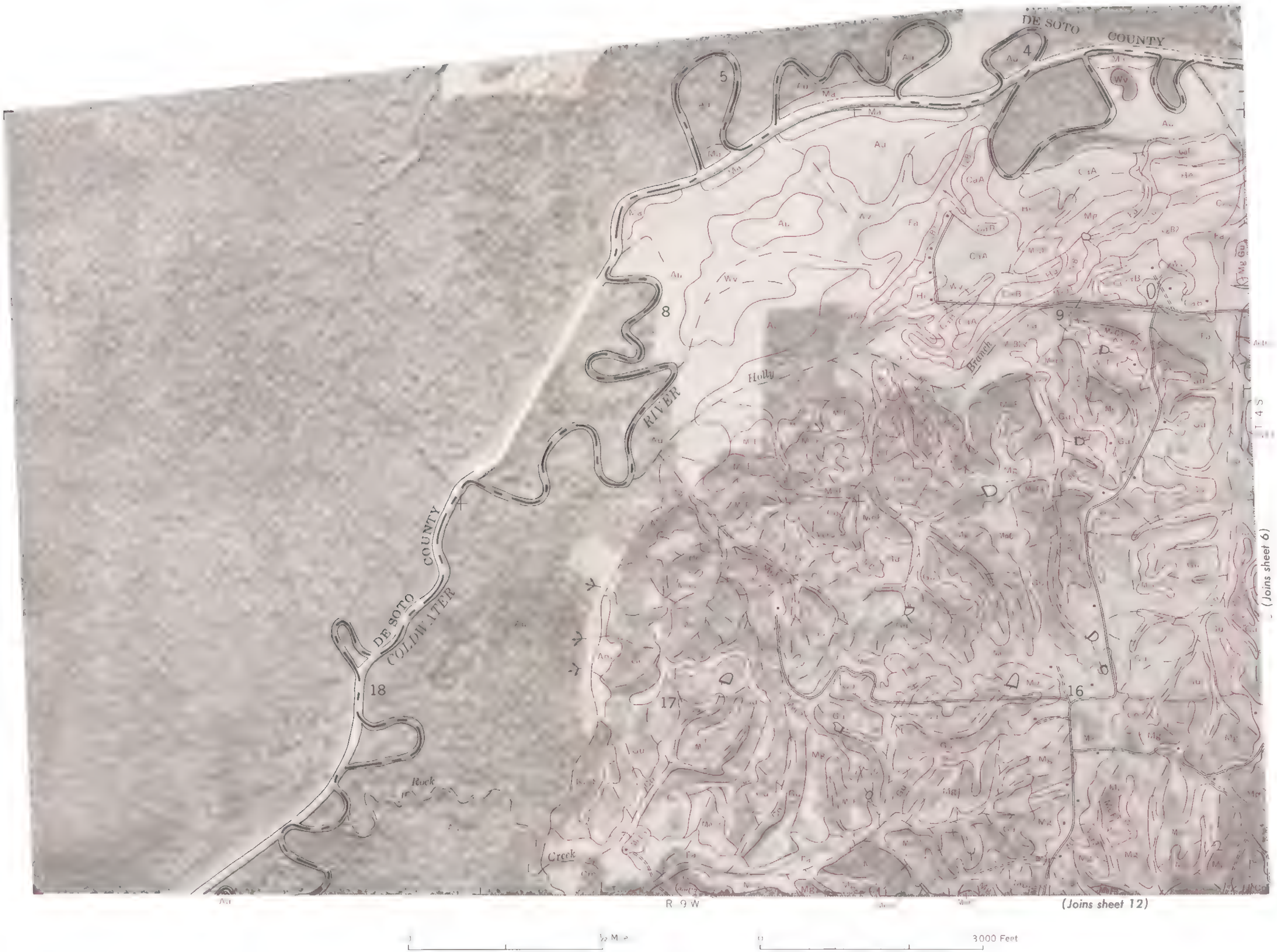



N
DE SOTO COUNTY
6
5
4
Greenleaf School
(Joins sheet 1)
(Joins sheet 3)
(Joins sheet 8)
0
½ Mile
0
3000 Feet

Range, township, and section corners shown on this map are indefinite.

TATE COUNTY, MISSISSIPPI — SHEET NUMBER 4

4



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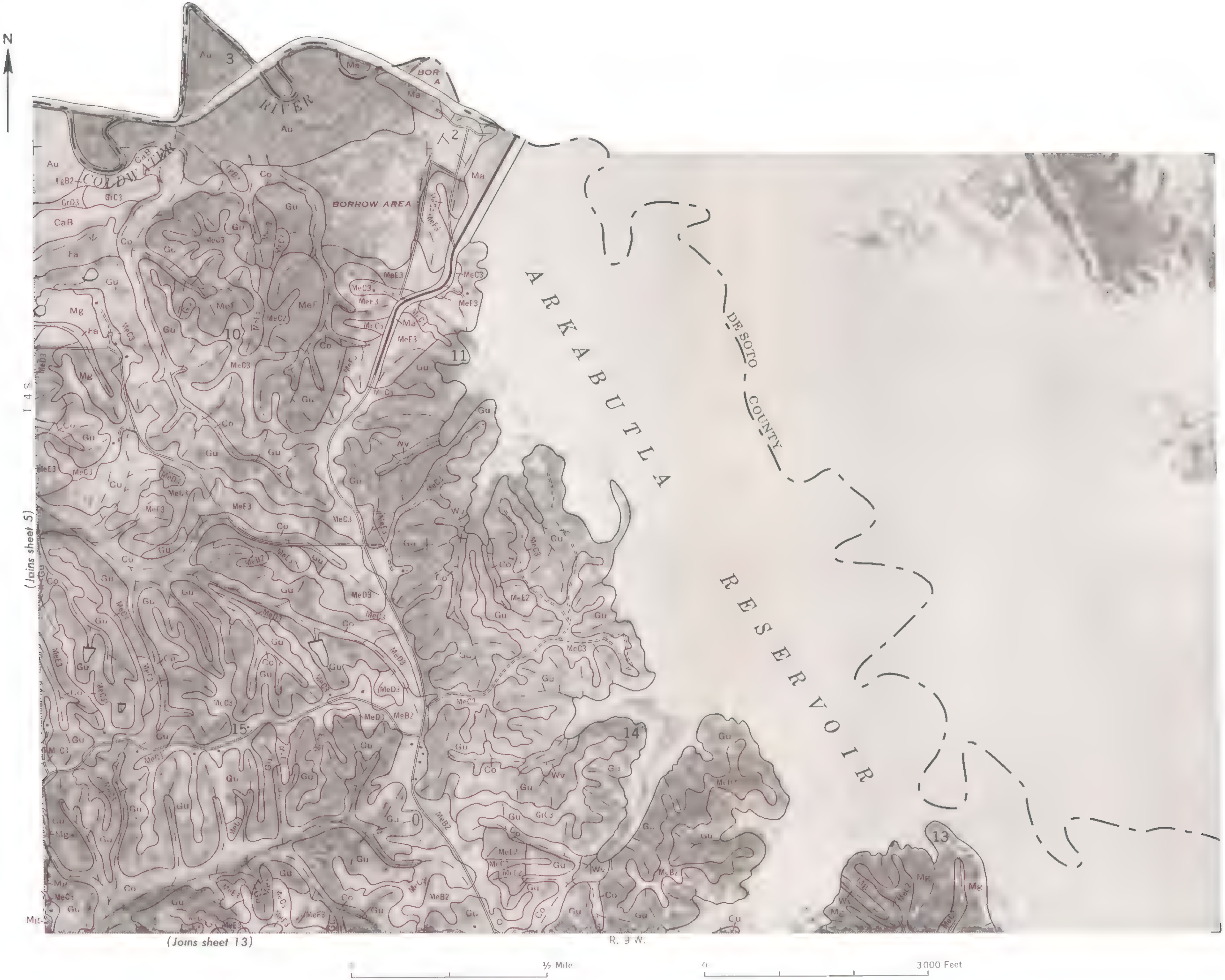
Range, township, and section corners shown on this map are indefinite.

6

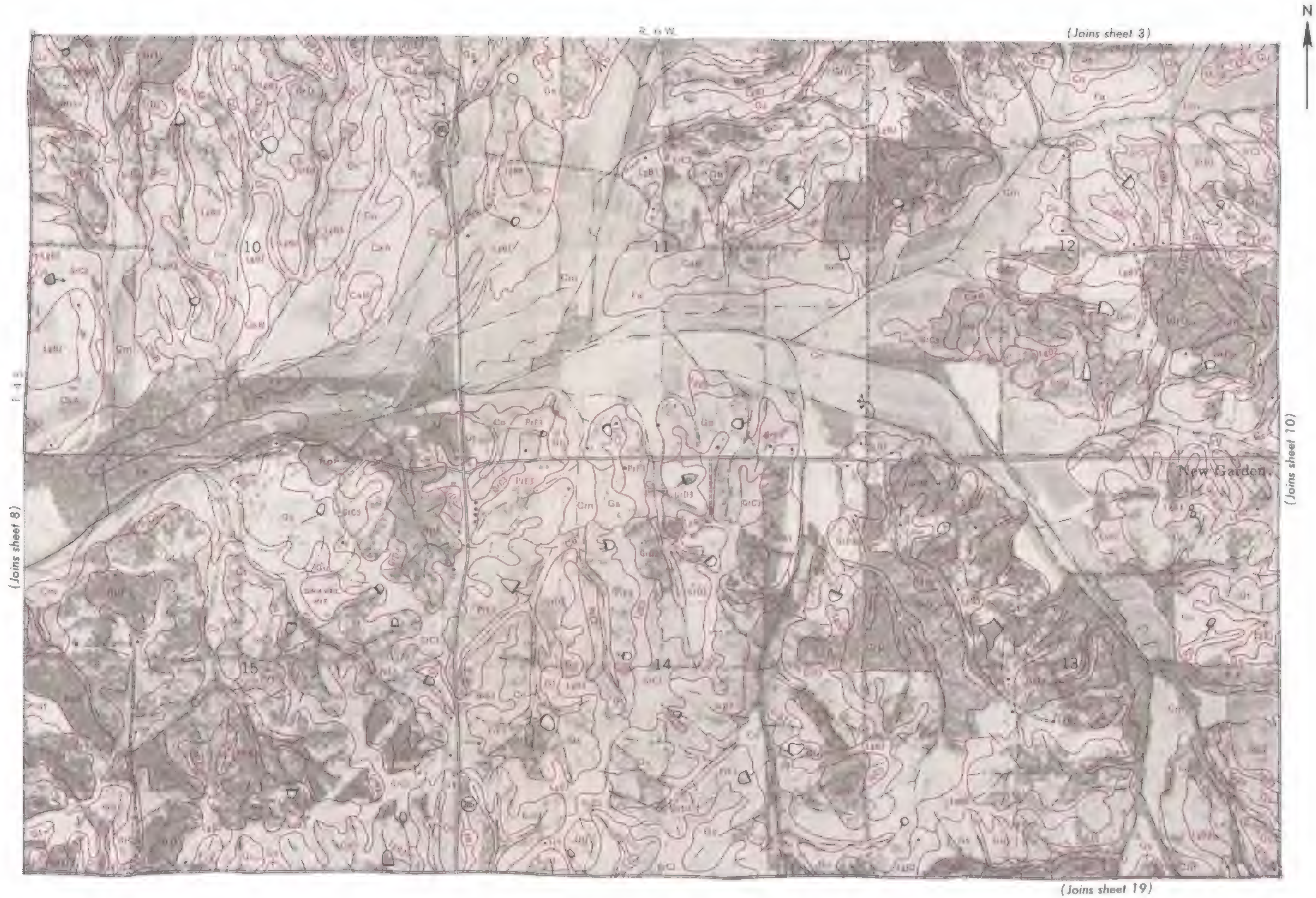

N
COLDWATER RIVER
BORROW AREA
ARKABUTLA RESERVOIR
DE SOTO COUNTY
T. 4 S.
(Joins sheet 5)
(Joins sheet 13)
R. 9 W.
½ Mile
3000 Feet

This map is one of a set compiled in 1965 as [illegible] United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners shown on this map are indefinite.

8


N
(Joins sheet 2)
R 6 W
(Joins sheet 7)
(Joins sheet 9)
(Joins sheet 18)
T. 4 S.
Daniels Chapel
Mt Olana Church
Lurline
7
8
9
16
17
18
½ Mile
3000 Feet



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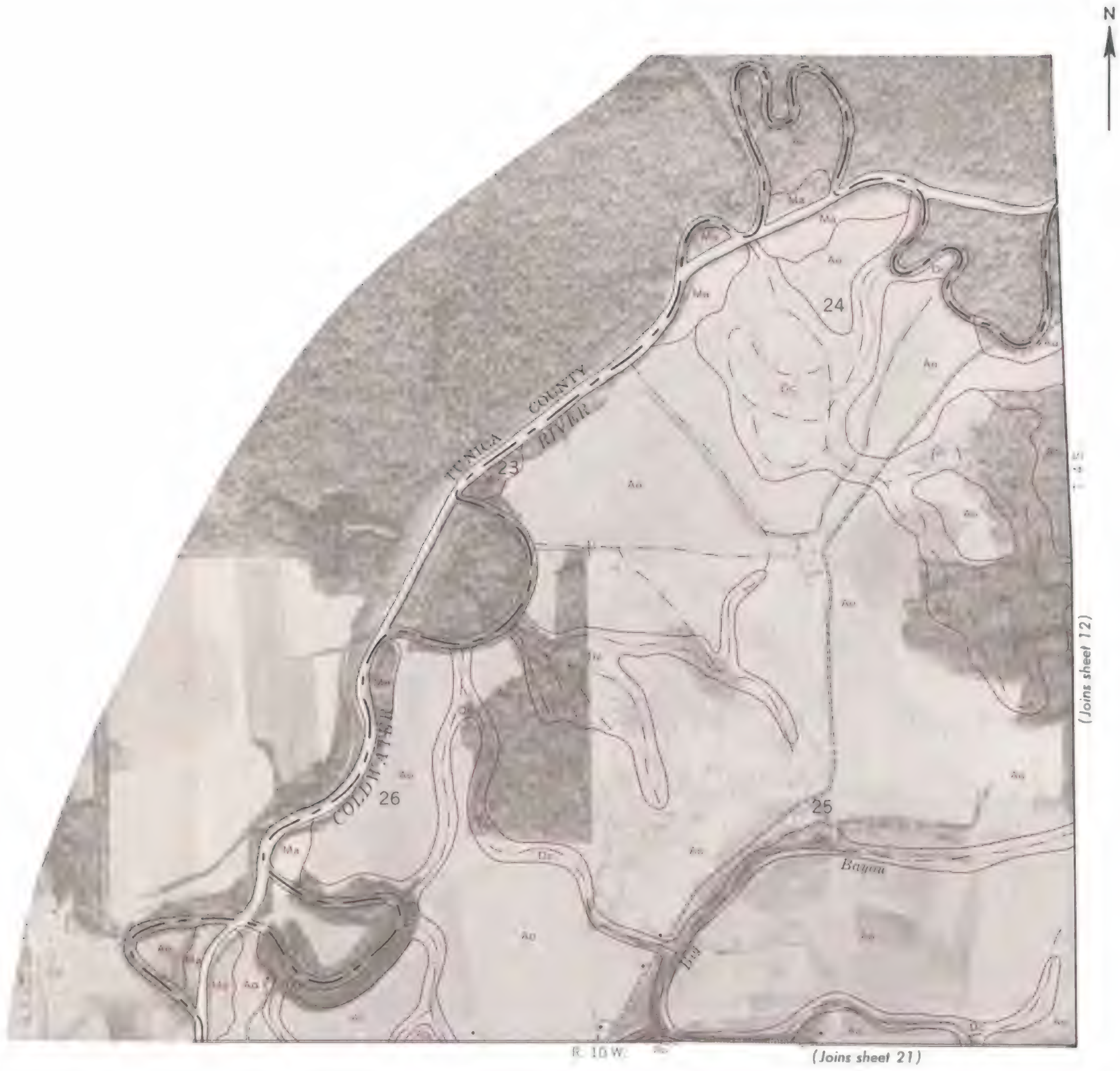
Range, township, and section corners shown on this map are indefinite.


N
(Joins sheet 4)
R. 5 W.
(Joins sheet 9)
(Joins sheet 20)
New Garden
Hebron Church
Wakefield
Lee School
HARMON CEMETERY
MARSHALL COUNTY
T. 4 S.
0
½ Mile
0
3000 Feet

and the Mississippi Agricultural Experiment Station.

Range, township, and section corners shown on this map are indefinite.



½ Mile

3000 Feet


N
(Joins sheet 5)
(Joins sheet 11)
(Joins sheet 13)
(Joins sheet 22)
R. 9 W.
T. 4 S.
DE SOTO COUNTY
COLDWATER RIVER
New Pleasant Hill Church
19
20
21
28
29
30
½ Mile
0
3000 Feet

0 ½ Mile

0 5000 Feet

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Range, township, and section corners shown on this map are indefinite.


14
N
DE SOTO COUNTY
R. 8 W.
ARKABUTLA RESERVOIR
DE SOTO COUNTY
T. 4 S.
19
30
29
28
(Joins sheet 13)
(Joins sheet 15)
(Joins sheet 24)
½ Mile
3000 Feet

[illegible] as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners shown on this map are indefinite.


N
(Joins inset, sheet 1)
(Joins sheet 15)
(Joins sheet 17)
(Joins sheet 26)
DE SOTO COUNTY
COLDWATER RIVER
ARKABUTLA RESERVOIR
BORROW AREA
ILLINOIS CENTRAL
COAXIAL CABLE
19
20
21
28
29
30
½ Mile
3000 Feet

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners shown on this map are indefinite.

18


N
(Joins sheet 8)
R. 6 W.
(Joins sheet 17)
(Joins sheet 19)
(Joins sheet 28)
T. 4 S.
Beartail
Buttermilk
Creek
Antioch
Bowman
19
20
21
28
29
30
0
½ Mile
0
5000 Feet

This map is one of a set compiled in ... as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners shown on this map are indefinite.

0 ½ Mile

0 3000 Feet


N
(Joins sheet 10)
R. 5 W.
(Joins sheet 19)
(Joins sheet 30)
T. 4 S.
MARSHALL COUNTY
HANCOCK CEMETERY
Roberts Chapel
Rockhill
19
20
21
30
29
28
0
½ Mile
0
3000 Feet

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TATE COUNTY, MISSISSIPPI — SHEET NUMBER 22

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Range, township, and section corners shown on this map are indefinite.

0 ½ Mile

0 3000 Feet

24


N
(Joins sheet 14)
R 8 W
ARKABUTLA RESERVOIR
31
32
33
Sweet Grove School
Antioch Church
6
5
4
(Joins sheet 23)
(Joins sheet 25)
(Joins sheet 35)
0
½ Mile
0
3000 Feet

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station

Range, township, and section corners shown on this map are indefinite.


N
(Joins sheet 16)
R. 7 W.
COLDWATER CEMETERY
Coldwater
ILLINOIS
CENTRAL
COAXIAL
CABLE
BORROW AREA
31
32
33
6
5
4
T. 4 S.
T. 5 S.
(Joins sheet 25)
(Joins sheet 27)
(Joins sheet 37)
0
½ Mile
0
3000 Feet

This map is one of a set compiled in 1955 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners shown on this map are indefinite.

TATE COUNTY, MISSISSIPPI — SHEET NUMBER 28

0 ½ Mile

0 3000 Feet

This map is one of a set compiled in 1969 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners shown on this map are indefinite.

30


N
(Joins sheet 20)
R. 5 W.
MARSHALL COUNTY
(Joins sheet 29)
(Joins sheet 31)
(Joins sheet 41)
Bet
31
32
33
6
5
4
HICKAHALA
CREEK
Bairds
Creek
Cm
Fa
At
Co
Gs
Gu

½ Mile

0

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners shown on this map are indefinite.

(Joins sheet 30)

(Joins sheet 42)

½ Mile

3000 Feet

N

½ Mile

0 3000 Feet

N

(Joins sheet 22)

(Joins sheet 32)

(Joins sheet 34)

(Joins sheet 44)

This map is one of a set compiled in 1963 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners shown on this map are indefinite.


N
(Joins sheet 23)
R. 9 W.
ARKABUTLA
CREEK
10
11
12
St Peters
Church
Eliphaz
15
14
13
T. 5 S.
(Joins sheet 33)
(Joins sheet 35)
(Joins sheet 45)
0
½ Mile
0
3000 Feet

Soil Conservation Service, United States Department of Agriculture
and the Mississippi Agricultural Experiment Station

Range, township, and section corners shown on this map are indefinite.


N
(Joins sheet 25)
R. 8 W.
(Joins sheet 35)
(Joins sheet 37)
T. 5 S.
(Joins sheet 47)
10
11
12
13
14
15
Hill Chapel
Antioch Church
½ Mile
0
3000 Feet

This map is one of a set compiled in 1969 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners shown on this map are indefinite.

0 ½ Mile

0 3000 Feet


N
(Joins sheet 27)
R 7 W
(Joins sheet 37)
(Joins sheet 39)
(Joins sheet 49)
10
11
12
13
14
15
Hickory Grove Church
Branch
0
½ Mile
0
3000 Feet

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners shown on this map are indefinite.


N
(Joins sheet 29)
(Joins sheet 39)
(Joins sheet 41)
(Joins sheet 51)
10
11
12
13
14
15
HICKAHALA
CANAL
½ Mile
0
3000 Feet

The map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners shown on this map are indefinite.


N
(Joins sheet 31)
R. 5 W.
(Joins sheet 41)
(Joins sheet 53)
T. 5 S.
MARSHALL COUNTY
Wyatte
10
11
12
13
14
15
Cm
At
Gt
RpF
0
½ Mile
0
3000 Feet

This map is one of a set compiled in [illegible] as part of a soil survey by the Soil Conservation [illegible] United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners shown on this map are indefinite.

N

0 ½ Mile

0 3,000 Feet

44


N
(Joins sheet 33)
R 9 W
(Joins sheet 43)
(Joins sheet 45)
(Joins sheet 55)
ARKABUTLA
CREEK
Creek
19
20
21
28
29
30
Strayhorn
½ Mile
0
3000 Feet

N

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Range, township, and section corners shown on this map are indefinite.

0 ½ Mile

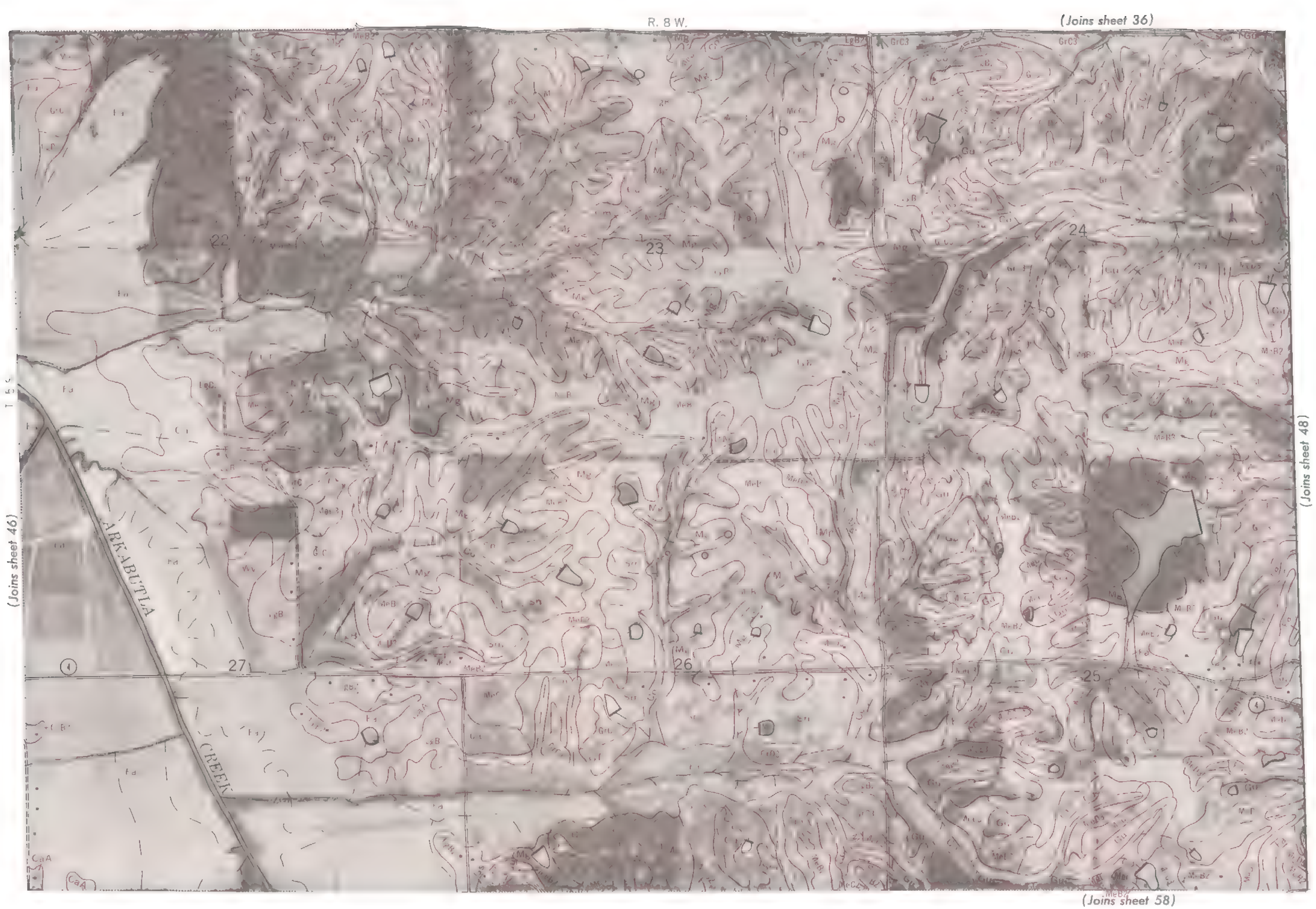
0 4000 Feet

46


N
(Joins sheet 35)
R. 8 W.
(Joins sheet 45)
(Joins sheet 47)
T. 5 S.
(Joins sheet 57)
ARKABUTLA
CREEK
19
20
21
28
29
30
½ Mile
3000 Feet

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners shown on this map are indefinite.



0 ½ Mile

0 3000 Feet


N
(Joins sheet 37)
R 7 W
(Joins sheet 47)
(Joins sheet 49)
(Joins sheet 59)
BORROW AREA
ILLINOIS CENTRAL
HICKAHALA CREEK
SENATOBIA CREEK
NORTHWEST MISSISSIPPI JUNIOR COLLEGE
SENATOBIA
COAXIAL CABLE
BORROW AREA
19
20
21
28
29
30
0
½ Mile
0
3000 Feet

N

(Joins sheet 38)

(Joins sheet 48)

(Joins sheet 50)

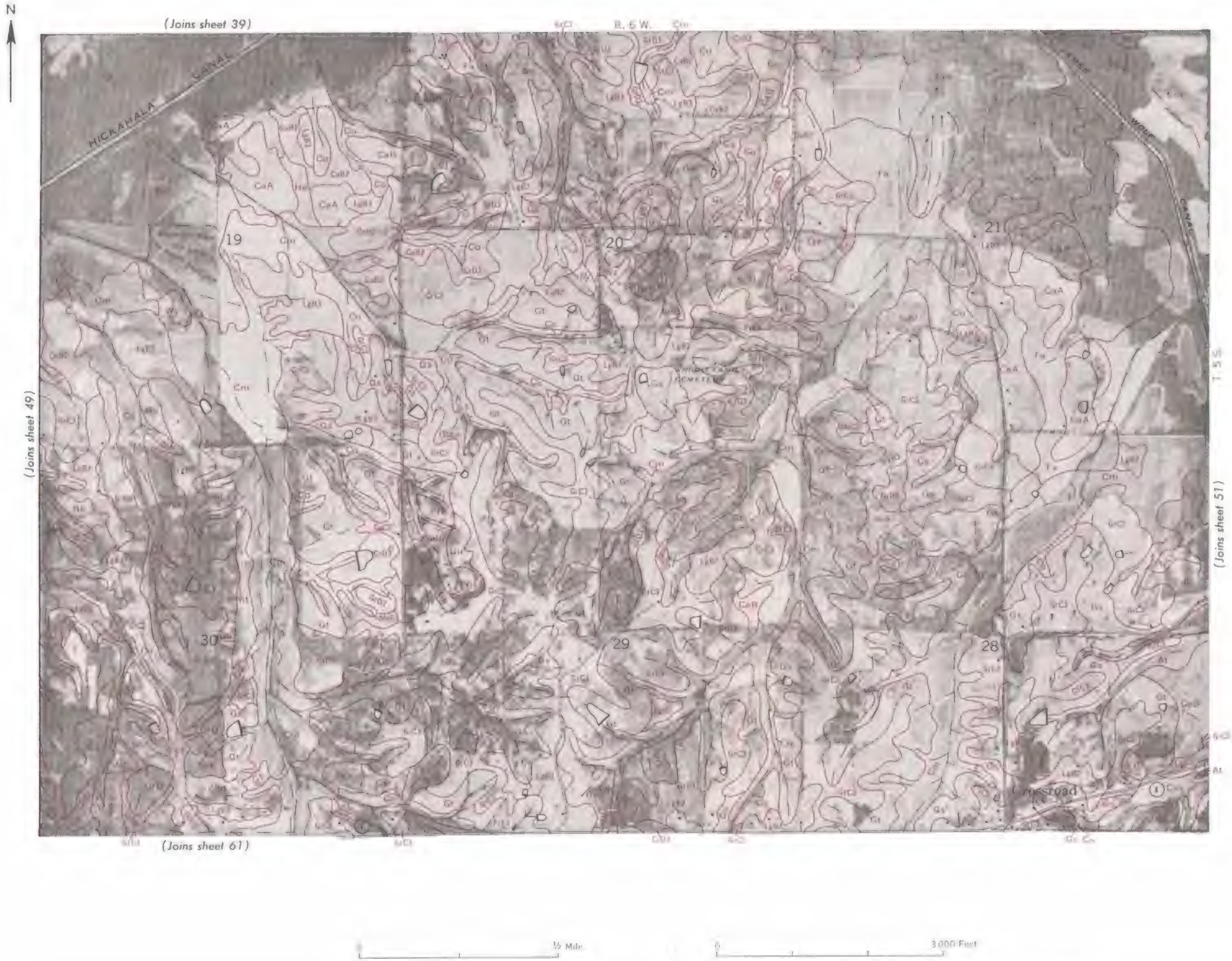
(Joins sheet 60)

½ Mile

5000 Feet

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture

Range, township, and section corners shown on this map are indefinite.


N
(Joins sheet 39)
R. 6 W.
HICKAHALA CANAL
WOLF CANAL
19
20
21
30
29
28
T. 5 S.
(Joins sheet 49)
(Joins sheet 51)
Crossroad
(Joins sheet 61)
½ Mile
3,000 Feet

N

0 ½ Mile

0 3000 Feet


N
(Joins sheet 41)
R. 5 W.
(Joins sheet 51)
(Joins sheet 53)
(Joins sheet 63)
T. 5 S.
Thyatira
Mt Zion Church
Aiken
JAMES WOLF CANAL
James Wolf Creek
19
20
21
30
29
28
0
½ Mile
0
3000 Feet

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners shown on this map are indefinite.


N
R. 10 W.
(Joins sheet 43)
(Joins sheet 55)
(Joins sheet 65)
COLDWATER
RIVER
TUNICA
COUNTY
ARKABUTLA
CREEK
STRAYHORN
ILLINOIS
CENTRAL
34
35
36
3
2
1
½ Mile
3000 Feet

This map is one of a set ... ed in 1969 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agr...

Range, township, and section corners shown on this map are indefinite.

0 ½ Mile

0 3000 Feet

N

(Joins sheet 45)

(Joins sheet 55)

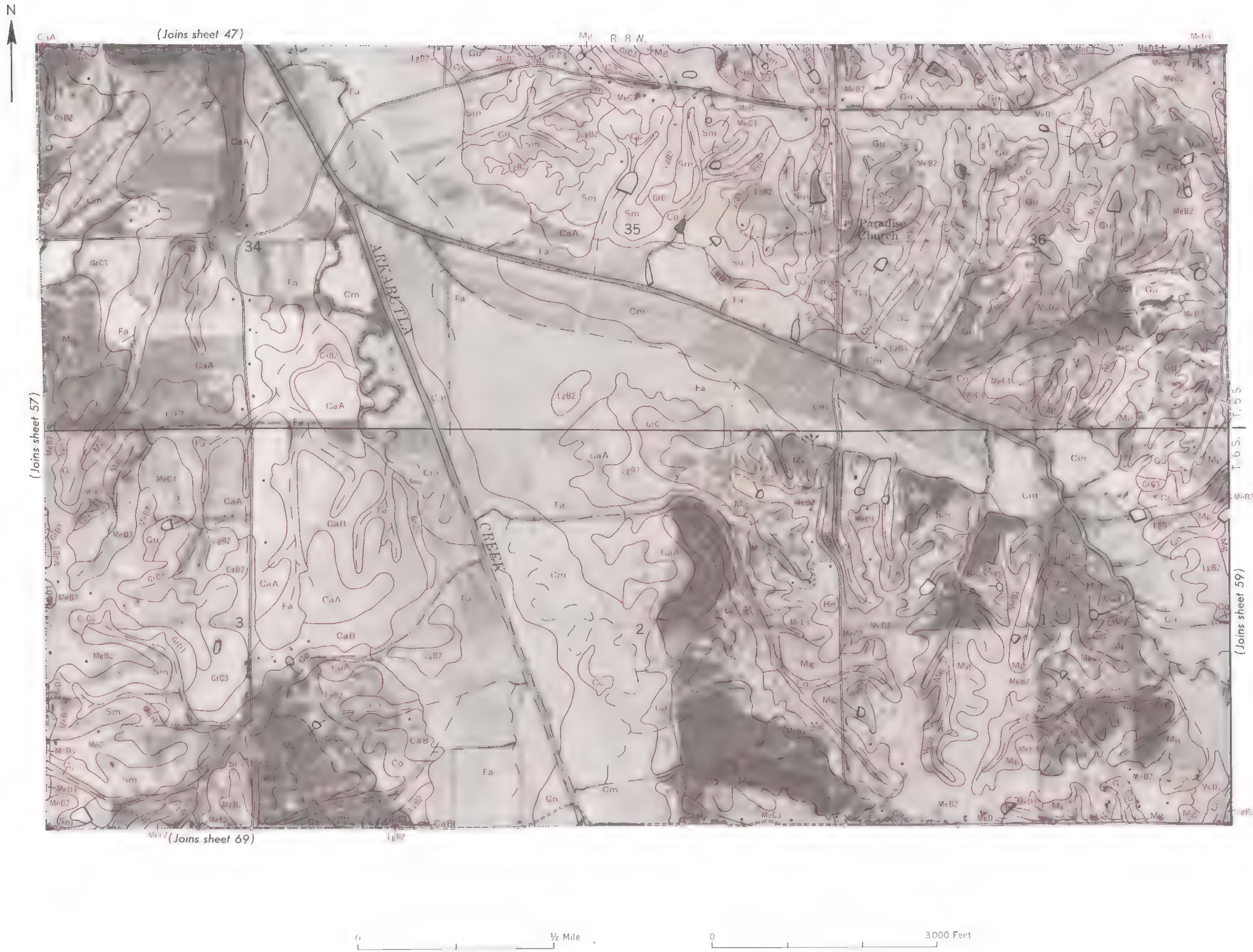
(Joins sheet 57)

(Joins sheet 67)

0 ½ Mile

0 3000 Feet

Range, township, and section corners shown on this map are indefinite.


N
(Joins sheet 47)
R. 8 W.
(Joins sheet 57)
(Joins sheet 59)
(Joins sheet 69)
T. 5 S.
T. 6 S.
34
35
36
3
2
1
ARKABUTLA
CREEK
Paradise Church
0
½ Mile
0
3000 Feet

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

Range, township, and section corners shown on this map are indefinite.

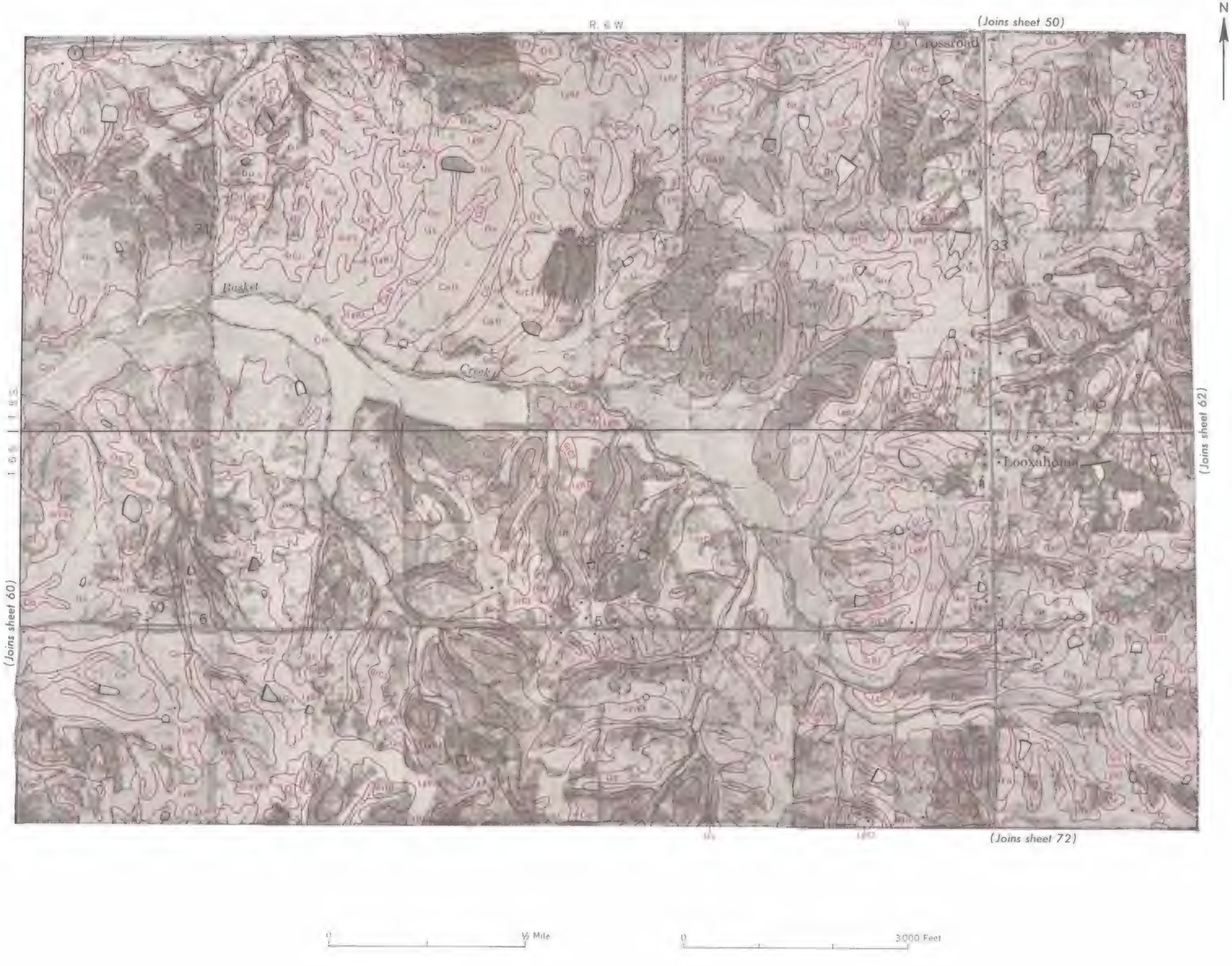
0 ½ Mile

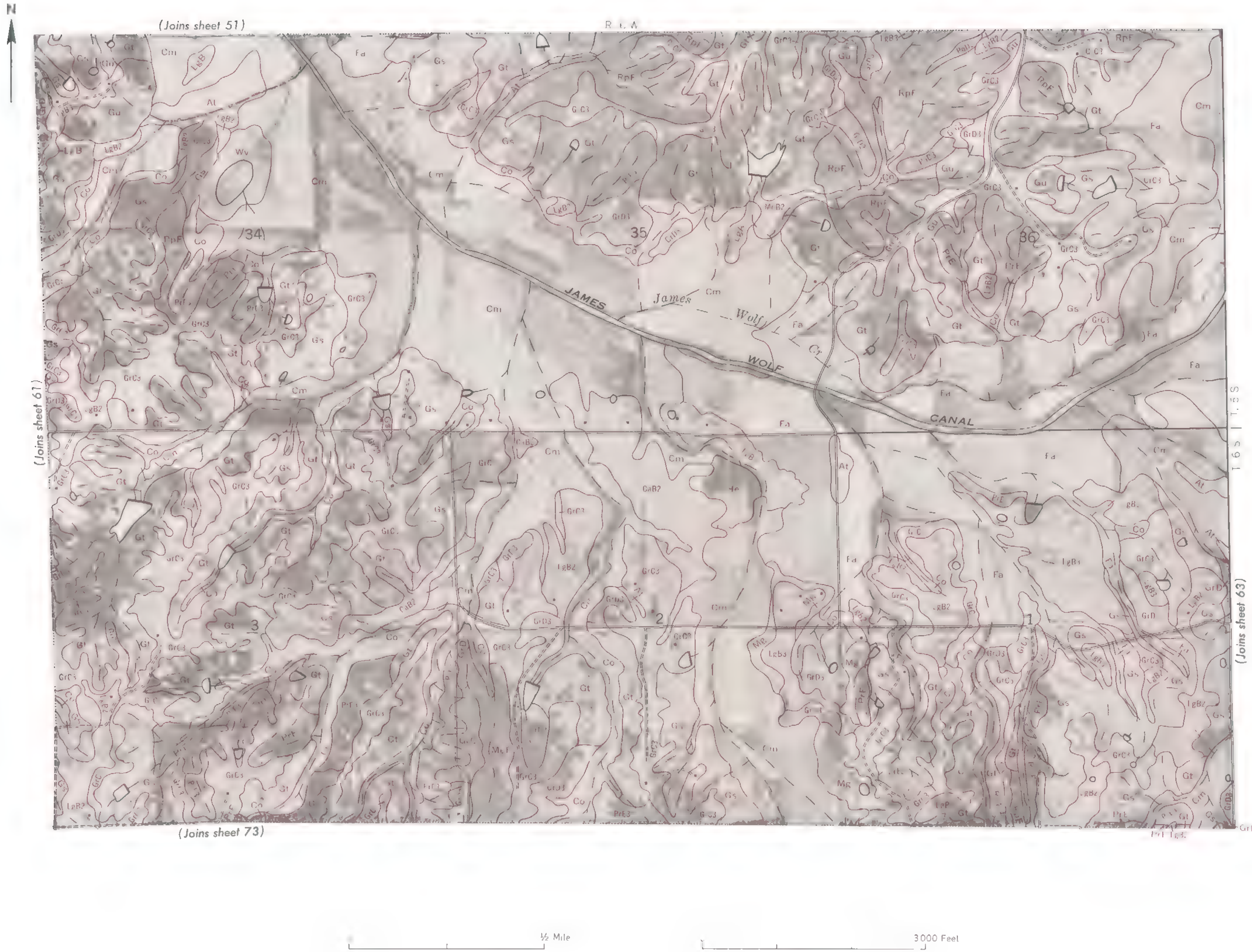
0 3000 Feet

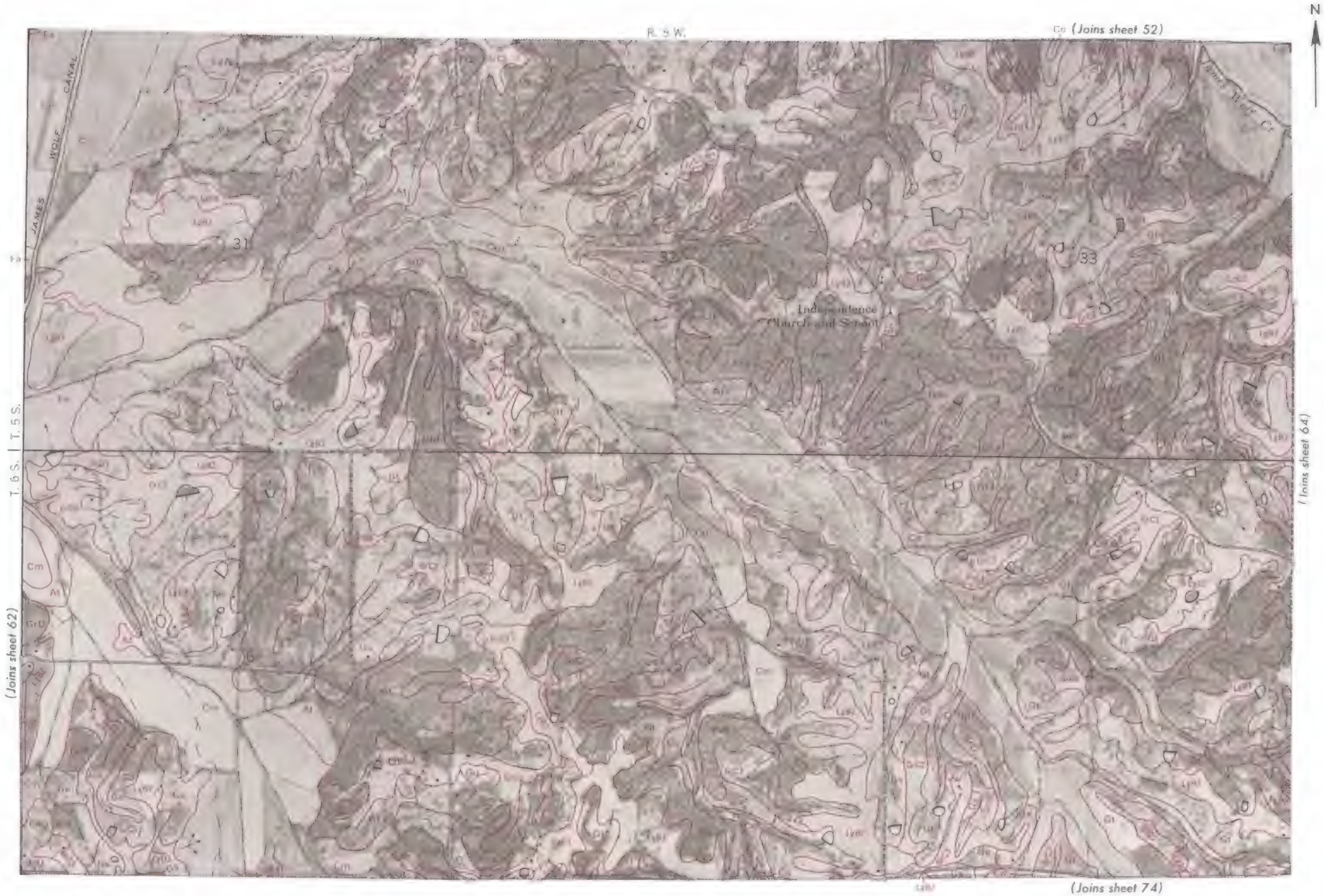

N
(Joins sheet 49)
Macedonia
Church and School
(Joins sheet 59)
(Joins sheet 61)
(Joins sheet 71)
T. 6 S. | T. 5 S.
SENATOBIA
CANAL
OLD
Basket
Creek
34
35
36
3
2
0
½ Mile
0
3000 Feet

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture and the Mississippi Agricultural Experiment Station.

Range, township, and section corners shown on this map are indefinite.



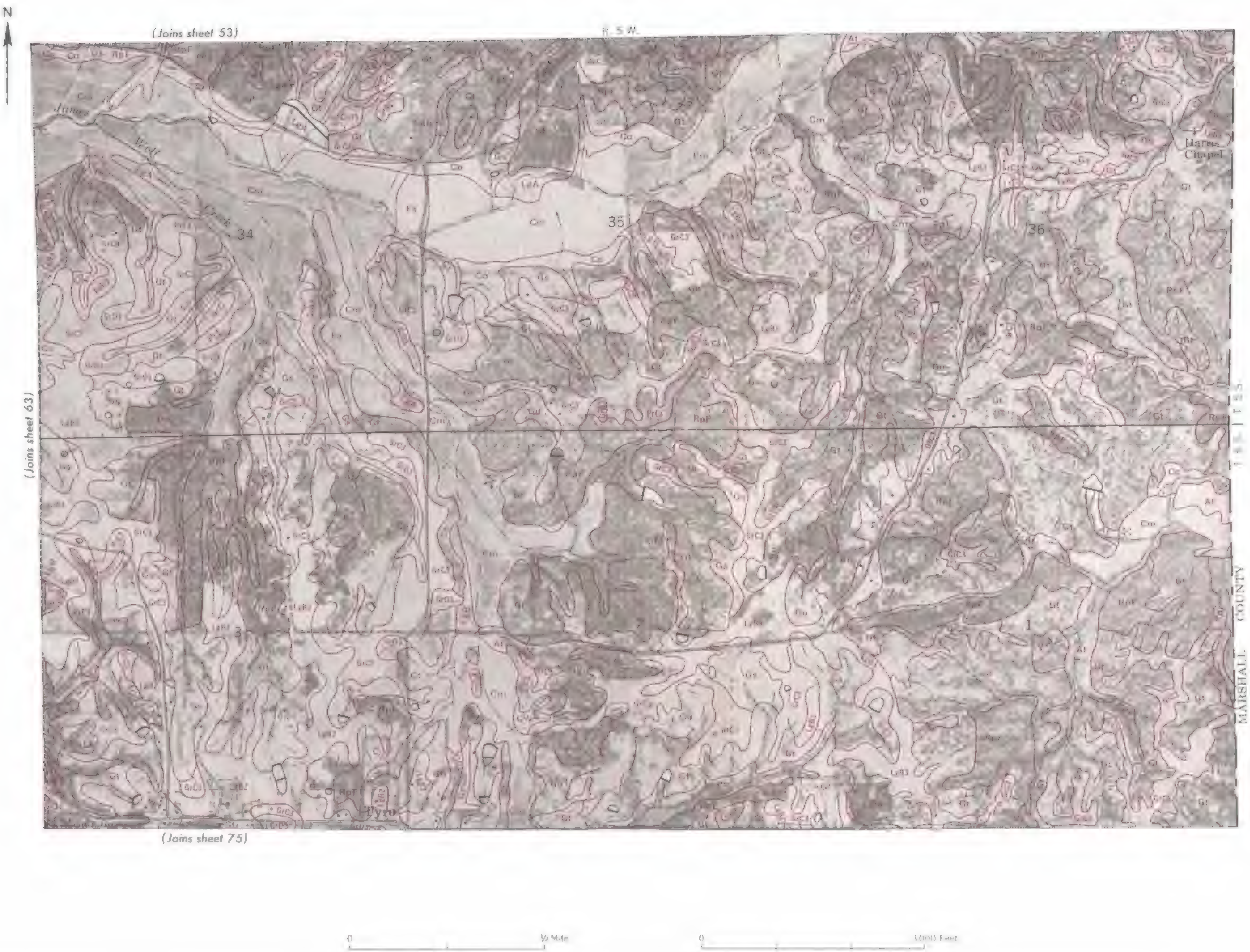

N
(Joins sheet 51)
(Joins sheet 61)
(Joins sheet 63)
(Joins sheet 73)
JAMES
WOLF
CANAL
James Wolf
34
35
36
3
2
1
½ Mile
3000 Feet



Range, township, and section corners shown on this map are indefinite.

½ Mile

1000 Feet


N
(Joins sheet 53)
R. 5 W.
(Joins sheet 63)
(Joins sheet 75)
34
35
36
1
Harris Chapel
MARSHALL COUNTY
0
½ Mile
0
1000 Feet

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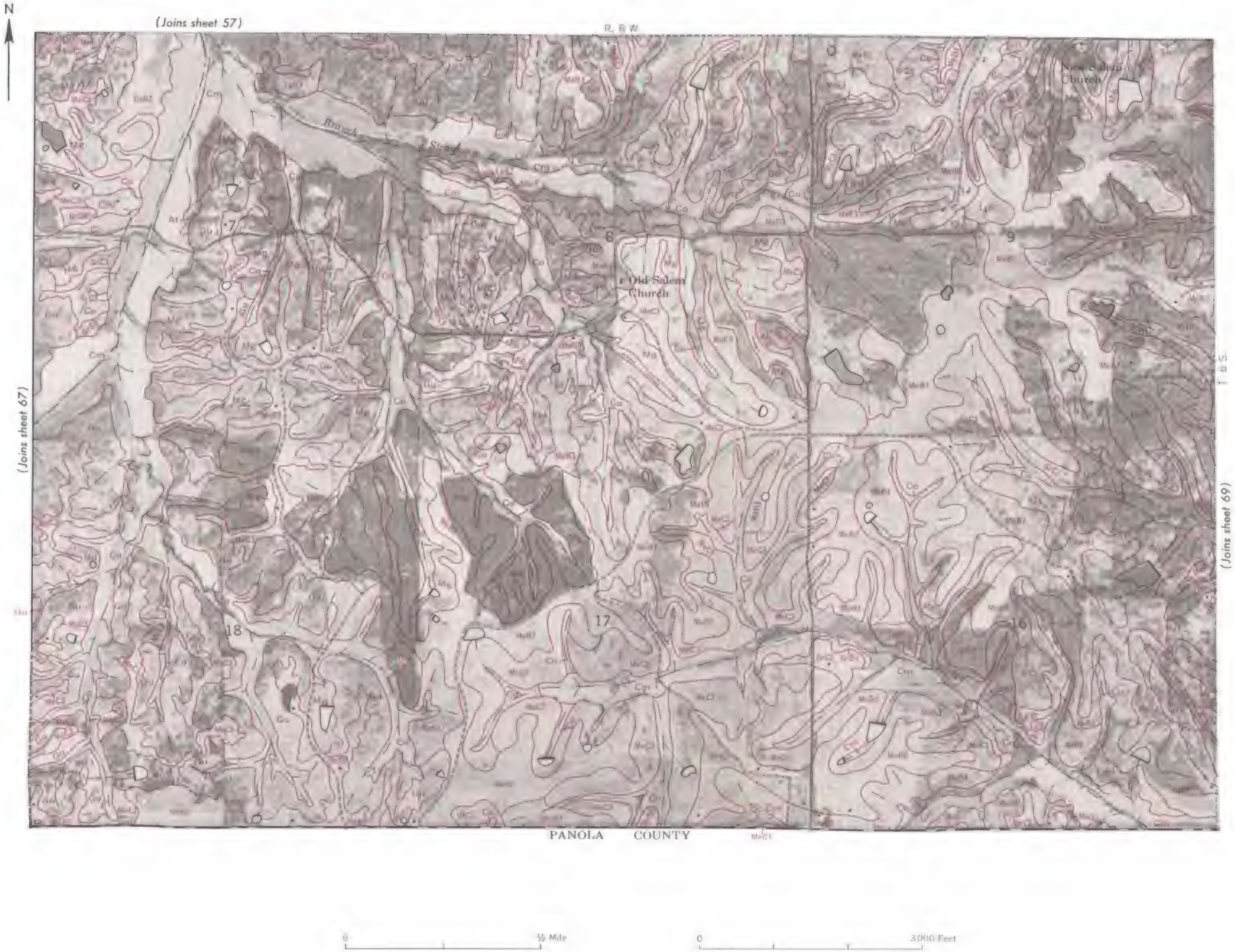
Range, township, and sect on corners shown on this map are indefinite.

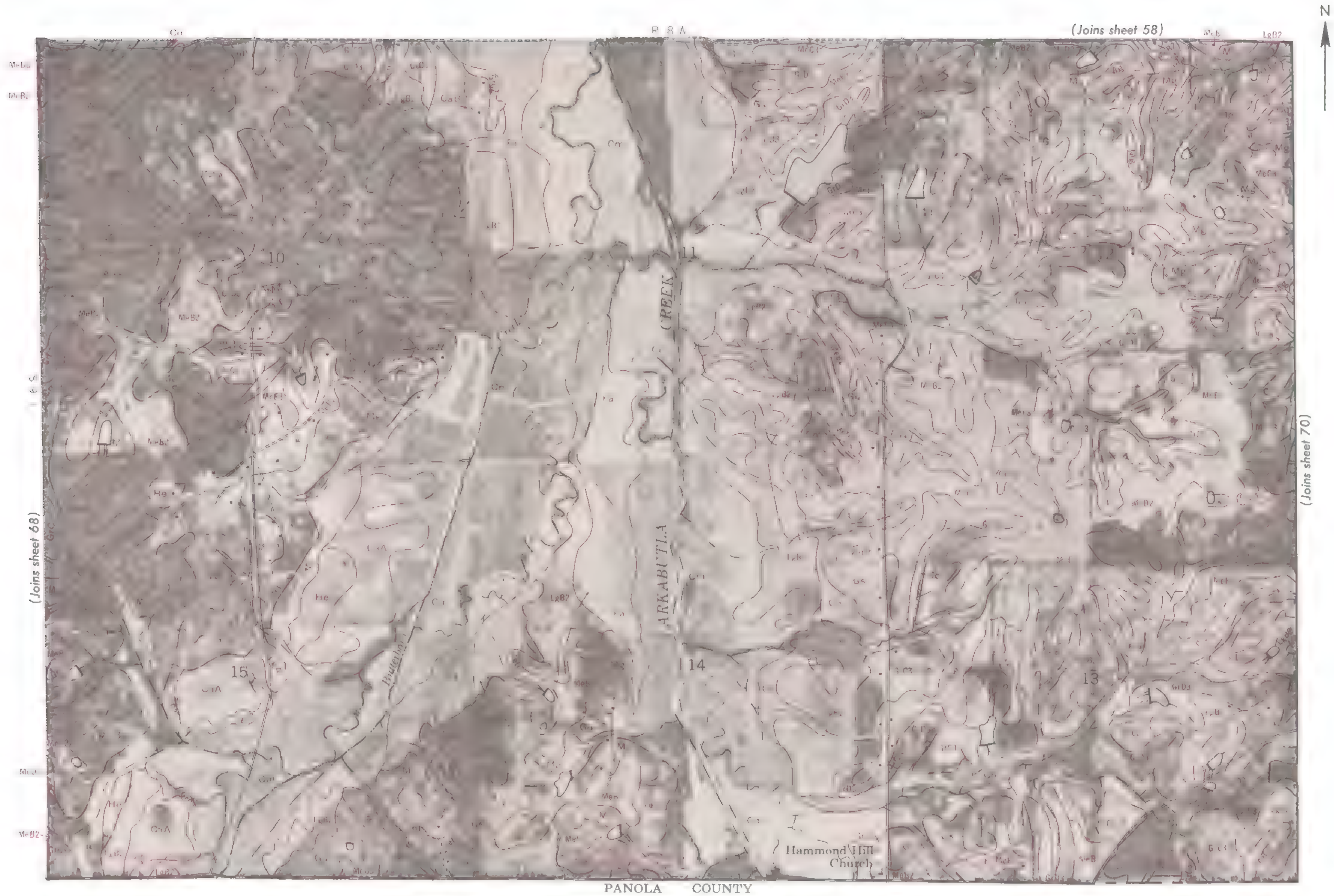
½ Mile

3000 Feet


N
(Joins sheet 55)
R. 9 W.
(Joins sheet 65)
(Joins sheet 67)
Goode
Treslow Church
Sandy
Branch
Sanders
Egypt
Creek
Terry
Branch
8
9
16
17
18
PANOLA COUNTY
0
½ Mile
0
3000 Feet


N
(Joins sheet 56)
(Joins sheet 66)
(Joins sheet 68)
10
11
12
13
14
15
PANOLA COUNTY


N
(Joins sheet 57)
R. 8 W.
(Joins sheet 67)
(Joins sheet 69)
T. 6 S.
Old Salem Church
New Salem Church
7
8
9
16
17
18
PANOLA COUNTY
0
½ Mile
0
3000 Feet



0 ½ Mile

0 3000 Feet

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TATE COUNTY, MISSISSIPPI — SHEET NUMBER 70

0 ½ Mile

0 3000 Feet

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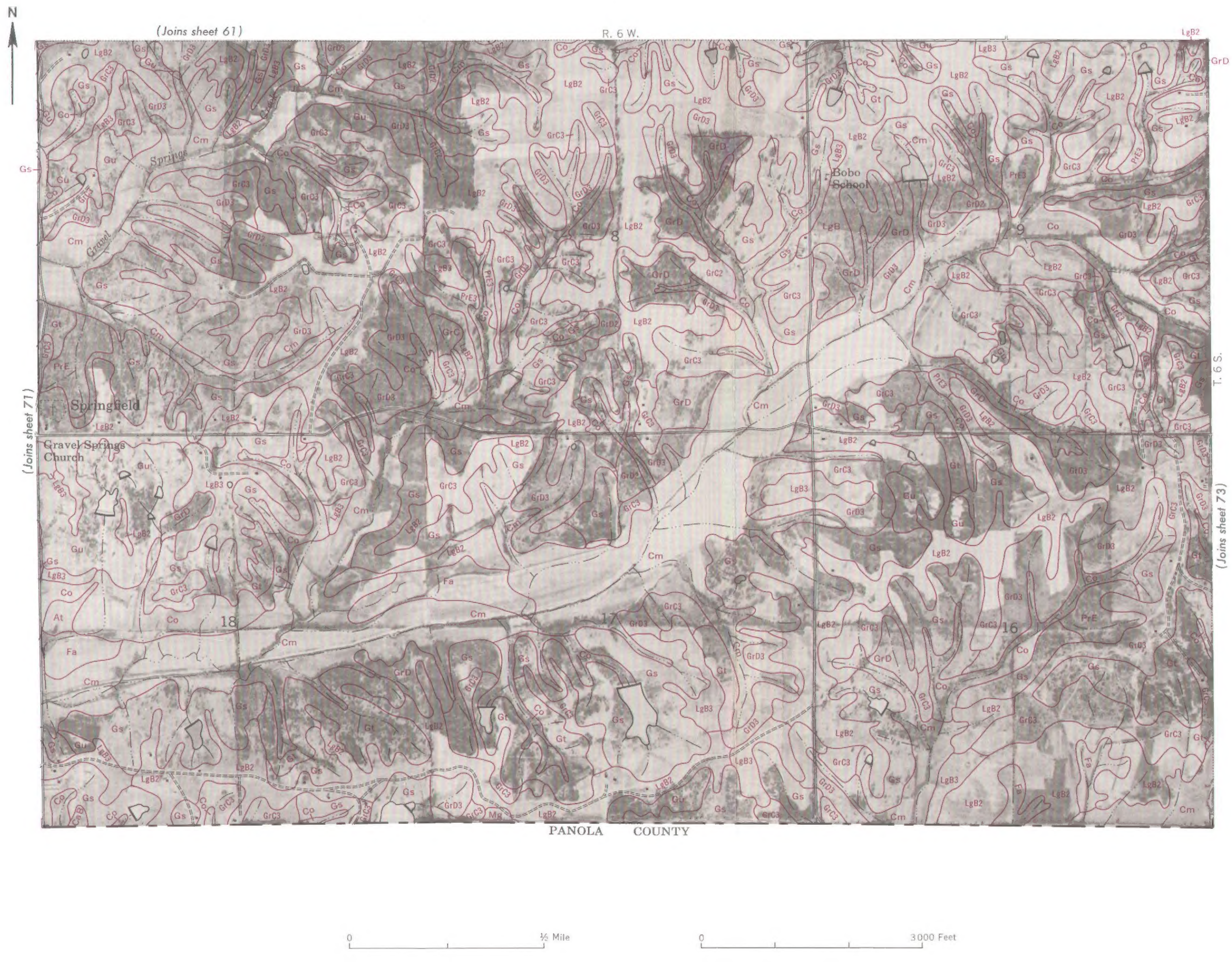
Range, township, and section corners shown on this map are indefinite.


N
(Joins sheet 61)
R. 6 W.
(Joins sheet 71)
(Joins sheet 73)
T. 6 S.
Springfield
Gravel Springs Church
Bobo School
PANOLA COUNTY
0
½ Mile
0
3000 Feet

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Range, township, and section corners shown on this map are indefinite.

0 ½ Mile

0 3000 Feet


N
(Joins sheet 63)
R. 5 W.
Mt Vernon Church
(Joins sheet 73)
T. 6 S.
(Joins sheet 75)
7
8
9
16
17
18
PANOLA COUNTY
0
½ Mile
0
3000 Feet

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Mississippi Agricultural Experiment Station.

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0 ½ Mile

0 3000 Feet